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Trade Relations with Germany

THE announcement that Mr. Oliver Stanley and Mr. R. S. Hudson are to visit Berlin next month is the best news which the business community has had for some time. Not that it was entirely a surprise to those who have followed the speeches of statesmen, both in this country and in Germany, during the past few weeks. To begin with, there was Herr Hitler's admission that Germany must "export or die." This statement was at once welcomed by the Parliamentary Secretary to the Department of Overseas Trade, who said that, if international tension could be removed, there was plenty of export trade to go round for both countries. Mr. Hudson added the hope that it might lead to "a sensible arrangement being reached between the governments to develop markets at reasonable prices, and the end of senseless cut-throat competition." Simultaneously came the announcement that the Federation of British Industries would shortly send delegates to Germany to discuss ways and means of putting these hopes into practical effect.

An agreement between the British and German coal industries had already been reached a few days previously. "All points of difference" had been settled, and as the two countries together supply 80 per cent. of European coal exports, a further agreement embracing Belgium, Holland, France and Poland is expected to follow. European relations should also be assisted by the fact that Mr. Hudson will visit Moscow and the Northern Capitals as well as Berlin.

All these happenings have drawn attention to the fact, overshadowed by the crisis, that a debts agreement was concluded with Germany last summer. In its report published a few weeks ago, the Council of Foreign Bondholders describes this as the "outstanding debt settlement of the past year," for besides providing for the treatment of Austrian debts, it formed a permanent settlement of German Reich debts, and a "notable advance towards a final solution of the foreign indebtedness of Germany."

Quite naturally, the German Ambassador used this agreement as his text at the annual banquet of the German Chamber of Commerce for the United Kingdom held on January 23. The time had come for all who endorsed the aims of the Munich Agreement to take up those ideas in the economic sphere and to press on with them. Germany and England had long been good customers

to one another and old ties might prove a valuable aid to new efforts. "It ought to be possible," Dr. Von Dirksen asserted, "to find a practical way to satisfy the needs of the individual nations for the exchange of goods, without getting entangled in theoretical discussions about the merits or demerits of this or that economic system."

At first sight, the ambassador's views may have seemed over-optimistic to British exporters confronted with barter and other methods of bulk trading in foreign markets. Yet the effect of these methods has not been so beneficial to Germany as popularly supposed. Both countries are, in fact, affected by world conditions and it seems that their fortunes in foreign trade have not so far been determined to any marked extent by the trading methods employed.

It was not surprising, therefore, that the chairman of the "Big Five" banks, at their annual meetings last month, should counsel caution in copying the totalitarian technique. They all urged the value of co-operation between British firms in tendering abroad. On the other hand, they suggested that large-scale subsidised competition from foreign sources need not be regarded as a permanent phenomenon. Mr. Colin Campbell said it would be foolish to allow ourselves to lapse into a general policy of export subsidy in the process of countering it. No doubt Mr. Campbell was thinking of the financial difficulties in which these subsidies are already involving the German Reich. The fact that her trade is not going well should make her politicians and business leaders all the more ready to discuss ways of easing the strain by a return to more normal methods.

Business circles in England are anxious to see the German economy in a healthy state again; it is recognised that German difficulties since the war have not been entirely of her own making, and that a prosperous Germany would contribute once again to European stability. Without entering into political discussion, it is generally agreed that Mr. Chamberlain's visits to Germany and Italy have revealed the peaceful desire of the ordinary people in those countries to their leaders. It seems likely that the trade missions shortly to take place will have the same effect on those responsible for the economic policy of the Reich.

If it is said in other countries that they must export or die, how fatally true is it of us that . . . our existence depends on our international trade. We have no desire to monopolise any markets, we do not want to prevent any country from selling their goods abroad. But we do want, and we must have, our fair share of the export trade of the world.

—The Rt. Hon. Oliver Stanley.

NOTES AND COMMENTS

A Perkin Medallist

MR. JAMES BADDILEY, director in charge of research of Imperial Chemical Industries, Ltd., Dyestuffs Group, to whom the Perkin Medal of the Society of Dyers and Colourists was presented last week has been continuously associated with the scientific side of the British dyestuffs industry for thirty years. After graduating with first-class honours in colour chemistry at Leeds University in 1907, and undertaking research work with Professor A. G. Green, he joined Levinstein, Ltd., as research chemist in 1909. During his early time with this company his interest was mainly in the field of azo colours and numerous patents taken out in the period 1909-1914 testify to his activity. When Levinstein, Ltd., amalgamated with British Dyes, Ltd., to form the British Dyestuffs Corporation, Mr. Baddiley took charge of the technical research departments and became a director of the company in 1929. One of his most notable achievements was in finding suitable dyestuffs for dyeing cellulose acetate. The marked improvements in the range and quality of British dyes and in works efficiency are due in large measure to Mr. Baddiley's chemical leadership; his career is an outstanding example of the fact that a high position in industry can still be attained by a scientist.

The British Industries Fair

THE British Industries Fair, the largest national trade fair in the world, has steadily grown in size, number of exhibitors and overseas buyers since it was first organised in 1915. This year has proved to be no exception to the rule. The increased number of exhibitors may be taken as showing the confidence of British manufacturers and their determination to foster the growth of export business in their own particular products. The main object of the Fair is to help export trade and at a time when the trade is beset with so many difficulties the opportunities it provides are all the more valuable. Perhaps the most striking item of all the facts and figures connected with this year's Fair, is the phenomenal increase in the number of overseas buyers. It is an increase of 25 per cent. on last year, and in the case of one country, the number of representatives is about five times as great. So far as experience in the chemical section at Olympia is concerned, it may be that a proportion of the buyers are either mainly interested in fixing up an agency abroad or have no intention of buying and have attended "to see what they can see." But at the very least one can say that the prospects of receiving worth-while inquiries at this year's Fair are brighter than they have ever been before.

Chemical Engineering at the B.I.F.

ALTHOUGH the Engineering Section of the British Industries Fair, at Birmingham, does not provide for the needs of those who wish to see exhibits of chemical plant ready for service in all the multifarious channels of manufacturing and using chemicals, it is surprising how much useful information can be missed by those who disregard an opportunity to visit this part of the Fair. Engineering is definitely a matter in which metals play their part; new metals and allied materials are continually being introduced for one purpose or another, but that they may ultimately find uses more specialised or of a greater service in a direction quite distinct from that

which originally prompted their introduction is not always prominently in mind. From the point of view of the chemical engineer and users of chemical plant generally, circumstances of minute proportion can easily alter conditions to such an extent that a new and better material is demanded, although it may not be found if search is restricted to the usual channels of inquiry. It is here, in particular, that the Engineering Section of the British Industries Fair can faithfully serve those who are in search of things by which plant operating troubles may be eradicated or the needs of the manufacture more faithfully served. Because a particular material is exhibited in one form, serving one particular purpose, it need not be assumed that that purpose is the only one or that the suppliers are rigidly opposed to other uses. An exhibition stand is always worth visiting if there is some prospect of gathering useful information.

The Institution of Chemical Engineers

THE annual meeting and dinner of the Institution of Chemical Engineers held on Friday of last week were the opening and closing functions of a most enjoyable day. Following the business of the meeting, Dr. Cullen delivered his presidential address: "My Fifty Years in the Explosives Industry." This was a highly interesting address full of incident and thought-provoking matter. We publish on the opposite page extracts from Dr. Cullen's address; they represent but a fraction of his remarks and can hardly do justice to a lengthy address which touched upon so many subjects and personal reminiscences. For example, at one point Dr. Cullen made some observations on certain aspects of the Rand which he considered worthy of emulation. He said that there had always been a wonderful spirit of co-operation in the gold-fields, even among rival controlling groups. There were no secrets about mining and metallurgical progress and whatever was good was published without reserve. In fact, the Rand was one large laboratory where schemes can be tried out with good-will on the grand scale. These are not limited to technical matters, he said, but are all-embracing, with the result that the industry is probably the most efficient of its kind anywhere. What a stimulating thought! In the afternoon, a paper on "Some contributions of chemistry and chemical engineering to steam generation," was read. A combination of practical advice and theoretical considerations, it gave valuable information on a little-discussed aspect of the subject.

No Increase in Income Tax

THE Chancellor of the Exchequer has made a bold and welcome departure from precedent in anticipating his Budget statement by several weeks in its most important particular. He informed the House of Commons on Monday of the proportions of the total bill for defence in 1939-40 which would be met by taxation and by borrowing. The amount to be raised by taxation will be £230,000,000, and as that figure is £44,000,000 less than the amount found under this head by the tax-payer in 1939, it follows that there will be no additional burdens to be announced in the Budget speech. Sir John Simon is clearly mindful of the extent of the imposts which industry and commerce have been called upon to carry for the sake of national re-armament. By making the tax position clear in February rather than in April, the Chancellor of the Exchequer has given a stimulus to which industry and commerce can hardly fail to react in a favourable way.

The Institution of Chemical Engineers

Presentation of Medals—Annual Meeting and Dinner

THE seventeenth annual corporate meeting of the Institution of Chemical Engineers was held at the Hotel Victoria, Northumberland Avenue, W.C.2, on February 17, with the president, DR. WILLIAM CULLEN, in the chair. The following officers and members of Council were elected:—President, MR. F. HERON ROGERS; vice-presidents, SIR HAROLD HARTLEY and MR. L. O. NEWTON; joint hon. secretaries, DR. A. J. V. UNDERWOOD and MR. M. B. DONALD; hon. treasurer, MR. F. A. GREENE; members of Council, MR. H. J. BUSH, MR. H. W. CREMER, MR. J. MCKILLOP, DR. E. W. SMITH; associate member of Council, MR. W. B. HEATON.

Dr. Cullen then presented the Osborne Reynolds, Moulton, and William Macnab medals. The Osborne Reynolds medal was presented to MR. HUGH BEAVER for "valuable constructive work." Mr. Beaver took a prominent part in the organisation of the Chemical Engineering Congress in 1936. The Moulton medal, presented annually in commemoration of Lord Moulton, Director-General of Explosives Supply in the Ministry of Munitions during the War, was awarded jointly to DR. J. H. DOBSON and PROFESSOR W. J. WALKER, Professor of Engineering at the University of the Witwatersrand, for their paper on "Engineering Problems associated with the Improvement of Temperature and Humidity Conditions of the Atmosphere in Mines at Great Depths." The William Macnab medal, for the best papers submitted in the associate-membership examination of 1938 was awarded to



Mr. C. T. Te Water, High Commissioner for South Africa in London, accepting from Dr. William Cullen, president of the Institution of Chemical Engineers, the Moulton and the William Macnab medals on behalf of the South African medallists.

MR. P. E. ROUSSEAU. Mr. C. T. Te Water, High Commissioner for South Africa in London, accepted the Moulton and William Macnab medals from Dr. Cullen on behalf of the medallists. The Junior Moulton medal was not presented at the meeting as MR. E. F. J. TOMALIN, who was awarded the medal and prize of books for his paper on "The Theory and Practice of the Treatment of Coal Washery Effluents" recently left the country to take up an appointment in the Dutch West Indies.

At the close of the meeting Dr. Cullen delivered his presidential address "My Fifty Years in the Explosives Industry," extracts from which are given below.

"My Fifty Years in the Explosives Industry"—Dr. William Cullen's Presidential Address

THE explosives industry is literally a key industry, and this was brought home to us in a most concrete manner during the great war, when companies not hitherto engaged on the production of military explosives easily adapted their plants to this manufacture. But leaving the war aspect altogether it is difficult to conceive of the continuance of our present civilisation without explosives, for there is hardly an article of every-day use which cannot be linked up directly or indirectly with them. Through them the essential raw materials of many industries are obtained.

Most explosives or explosive mixtures, as all know, are, in the physico-chemical sense, somewhat unstable as the bonds which tie the atoms together are not nearly so strong as they are, say, in starch or sugar. When ignited or detonated the atoms rapidly resolve themselves into more stable forms; gases are evolved and the power factor depends on their volume, the rapidity of their evolution and the number of calories produced. Some, such as gunpowder—which is a mechanical mixture of nitrate of potash or soda, sulphur and charcoal—are slow in action for the chemical processes have to proceed from particle to particle. Moreover, a very large proportion of the whole, for instance the KN of the KNO_3 , takes practically no part in the chemical reactions at all, though it forms 70 to 75 per cent. of the total. The explosion in this case is in essence a rapid oxidation of the sulphur and the charcoal by the oxygen of the KNO_3 or NaNO_3 . Gunpowder is, therefore, a "low" explosive in contradistinction to those designated "high" which have a nitro-glycerine, a nitrocellulose or a tri-nitrotoluol base, as these bodies are completely converted on detonation into gases with consequential higher power.

The development of gunpowder is in itself a fascinating

story but I have not the time to go into it beyond saying that when I entered the industry it was by far the most important explosive in use on the basis of tonnage. Smokeless powders, for sporting purposes, had been in general use for some years but there were no military smokeless powders at all. In coal mining, gunpowder had been superseded to a small extent by the new high explosives based on nitro-glycerine, but in every sphere of use there were distinct indications that great changes were on the way.

I made a reference to Alfred Nobel in my presidential address of last year, but on this occasion I cannot dismiss him in a few words for his influence on the explosives industry was not only profound but lasting. Indeed, until a few years ago it could be said that the explosives which he evolved seventy to seventy-five years ago had served industrial requirements so well that they had remained practically unchanged. At the time of which I am speaking, he was in his prime and was busily engaged in upsetting all the preconceived ideas and practices. He was not, however, the discoverer either of nitro-glycerine, nitrocellulose or fulminate of mercury which formed the basis of most high explosives at that time. Nitro-glycerine, $\text{C}_3\text{H}_5(\text{NO}_3)_3$, was first made by the Italian chemist Sobrero in 1846. In the previous year, Schönbein, of Bâle, discovered nitrocellulose, $\text{C}_6\text{H}_5\text{O}_2(\text{NO}_2)_3$. Howard, an Englishman, discovered fulminate of mercury, CNO_2CNHg , in 1799. Nitro-glycerine might have been classed as a "chemical curiosity" till Nobel took it in hand, but fulminate of mercury had been the essential ingredient of percussive caps for guns for a long time before Nobel commenced to employ it in other directions.

Gunpowder had—until fifty years ago, been to all intents

and purposes the only explosive employed in the mining of coal, but its use was accompanied by a great many accidents, and little wonder, for a flame was invariably produced. One of the most important developments in connection with the use of explosives was made by an Englishman, William Bickford, and I mention this fact with particular pleasure, for very few of the fundamental inventions connected with the industry can be ascribed to our fellow countrymen. His, Bickford's, object was to provide a core of powder, thin and continuous, along which the fire might travel slowly at a uniform and determined rate of speed. "Bickford Fuse," and it is known by that name throughout the world, has done more than any other invention, or combination of inventions, to safeguard life in mining operations.

Nobel's Discovery of Dynamite and Blasting Gelatine

But I must hark back to Nobel, the father of the modern explosives, whose centenary was celebrated on January 5, 1934, in London. Many great discoveries come about by sheer accident and this can truly be said at least of some of Nobel's. His great difficulty was to supply his "blasting oil" (nitro-glycerine) in a form which was relatively safe for use. He accomplished this in the first case by absorbing it in kieselguhr, an infusorial earth, and this mixture of the two is the original "dynamite," though the term to-day has become somewhat generic. The general composition was 75 per cent, nitro-glycerine and 25 per cent, kieselguhr and this was a most useful high explosive. Later on, by pure accident, he discovered that dinitrocellulose, which was then known to be soluble in a mixture of ether and alcohol in contradistinction to the tri-nitro body which was insoluble, was also soluble in nitro-glycerine. When the percentage of the former was increased from 8 to 10 per cent, a gelatinous colloidal mass was formed which could be moulded and shaped to any desired form. This was designated "blasting gelatine" and is still so designated—the strongest practicable industrial explosive ever produced, and, so far as one can see, the strongest which ever can be produced, because it is, on detonation, completely resolved into gaseous products, the reactions taking place rapidly at a very high temperature. These two typical high explosives form the foundation of the high explosives industry as we know it to-day, but the means whereby their potential power could be utilised to the best advantage had still to be discovered. At this time of day it is impossible to re-create the train of thought which led Nobel ultimately to the fulminate of mercury detonator, which is still in general use, though in many directions it has been superseded—but only within the last few years.

Nobel naturally knew that fulminate of mercury was the main ingredient of percussive caps, as has already been mentioned. He also knew all about the "Bickford Fuse." Nevertheless, his first attempts to originate a powerful explosive impulse were by means of gunpowder. Later on he employed lead capsules as a container for fulminate, and, still later, the copper capsule as we know it to-day, the actual detonating mixture consisting of 20 per cent, of chlorate of potash and 80 per cent, fulminate of mercury.

I have referred to "Bickford Fuse" as having done more than any other invention to safeguard human life, but Nobel's discovery of the fulminate detonator is probably the greatest invention of all for without it the modern high explosives would have been a positive danger to those employing them.

The Original Smokeless Powder

For reasons which are obvious, all the great Powers fifty years ago were anxious to increase the power and the range of their weapons of destruction. Moreover, gunpowder had many bad qualities, not the least of which was the amount of smoke produced, which clearly indicated to an enemy the origin of rifle or gun fire. Nobel, working on the blasting gelatine idea, discovered that by adding increased amounts of soluble nitrocellulose to nitro-glycerine a horny mass could

be produced, and if this were heated, the plastic mass could by suitable machinery be rolled into sheets, which could in turn be cut into cubes or flakes. Thus he produced a smokeless propellant which he called "Ballistite"—the father of all modern smokeless military powders, including our own, cordite.

We must assume that all explosive bodies are in a state of unstable equilibrium, and, indeed, this is the case. If this equilibrium is disturbed in some specific manner by a detonator, for instance, the atoms rearrange themselves into a more stable form with great velocity, as has already been mentioned, and the results, so far as rearrangement is concerned, are in most cases approximate to theory. Frankly, we do not know the mechanism of detonation and possibly never shall do, but there is no doubt about the effect. The atoms of the explosive are rearranged almost instantaneously and the gases are furthermore expanded through the evolution of heat. When very large charges are used and they are properly placed there is very little noise. Much noise generally connotes inexperience and wastefulness. But the detonator itself has to be set off by means of a flame which is provided by the "spit" of the gunpowder core of the safety fuse.

Properties of the Ideal Detonator

The manufacture of detonators or initiating explosives is a somewhat dangerous operation and many precautions have to be taken, but both the fulminate itself and the chlorate must have certain specific properties which are now well understood. The ideal detonator should have the following properties:—

1. It must not be too sensitive to shock or friction.
2. The detonating mixture must be in granules or crystals of such a size and structure as to run easily through the loading machines—for discharge into the tubes or containers.
3. The crystals of the mixture must be hard, at least, so hard as not to break into dust under the stress of loading.
4. The mixture must have a high specific gravity so as to take up little room in the tube.
5. The ingredients of the mixture must bind well, *i.e.*, they must not loosen or drop out. The function of the chlorate is essentially a binding one.
6. Although the mixture adheres to itself and to the walls of the tubes, it must not adhere to the punches of the loading machines.
7. It must be sensitive to flame such as the "spit" from the gunpowder of the safety fuse.
8. It must be chemically stable to atmospheric influences and to the heat of the tropics, also it must not react with the metal of the tube.
9. It must not be hygroscopic as this would mean loss of detonating effect.
10. It must not exhibit the property of refusing to explode if it has been pressed too heavily.

The Lead Azide Detonator

The copper fulminate detonator is not perfect, but it is still employed a great deal and no other kind is allowed in gassy coal mines where "permitted explosives" have to be used. The copper azide detonator would also be allowed. However, researches conducted over a great many years have resulted in the evolution of what is generally called the lead azide ($Pb N_6$) detonator, which in certain respects is a great advance on the fulminate one. On the part of manufacturers there has always been a desire to get away from fulminate, as the world's supplies of mercury are very limited and controlled. Picric acid, tri-nitrotoluol and tetryl (tri-nitro-phenyl-methylnitramine) have all had a vogue and some are employed to-day, but, in my opinion, the so-called lead azide detonator is superior to all others, and it in effect satisfies nearly all requirements.

To Germany belongs the credit of introducing a class of

explosives to increase the safety factor largely based upon nitrate of ammonia, which, on detonation, gave much cooler gases and consequently less flame than those hitherto employed. Much work along similar lines was done in this country, and as an indication of the trend of thought, to a nitro-glycerine explosive, which obviously evolved much heat, was added a considerable quantity of sulphate of magnesia, the idea being that the heat of the explosion reactions would be absorbed in evaporating the seven molecules of water which the sulphate contained—which in fact was perfectly true. For technical reasons this explosive had to be abandoned. I have already said that the British conception of cooling the gases was to tackle them at the source by adding cooling agents, but the distinguished Belgian Lemaire as the result of years of research evolved other ideas, and I think he was right and that we were wrong. What he did was to enclose the explosive in a sheath of cooling material. By this simple device the addition of cooling bodies to the explosive itself may be obviated and the strength need not therefore be impaired by dilution with so-called cooling agents. The technical staff of the Imperial Chemical Industries, Ltd., factory at Ardeer have developed this idea a stage further and the sheath which they have produced, and which has proved very effective in practice, consists of bicarbonate of soda made into a felt by the addition to it of wood pulp. In my opinion, "sheathed permitted explosives" are by far the safest and, therefore, the best for gassy and dusty coal mines.

The Annual Dinner—Sir Alexander Walker Comments on the Severe Competition Ahead

Dr. Cullen took the chair at the seventeenth annual dinner of the Institution held at the Hotel Victoria.

SIR ALEXANDER WALKER, K.B.E., proposing the toast of "The Institution of Chemical Engineers," spoke of the difficulties which industrialists had to-day as compared with the position many years ago when income tax was 2s. 6d. in the £ or even less and the managing director of a business was more able to average out the losses and the possible average chances of success, for example, when asked to support new patents. To-day, however, having regard to income tax, super tax, etc., the cover for any possible losses was very considerably less than it used to be. The only thing that could take the place of supporting undertakings and help to develop new enterprises were large combinations such as the I.C.I., and the Distillers Co., but even they had to take care to avoid undue risks. Therefore, it seemed to him that in order to maintain industry in this country and enable it to develop, something else must be done. In Germany, the Government was taking a hand in these matters without regard to economics and it seemed to him that in the future the Government of this country would have to do something to stimulate industry because it was only in that way that new ideas would be forthcoming and be capable of development.

There was a fertility of mind and research developed by the discipline of the people on the Continent which we did not give them credit for and we in this country would have to become much more active if we were to hold our own. The same thing was happening in other European countries than Germany and he was inclined to feel that both physically and mentally we were only just beginning to wake up to all that was possible in regard to competition in the future. For all these reasons he felt that an organisation like the Institution of Chemical Engineers with its 1,000 members, who had to pass a very rigid examination to enter, could do a great deal to fit this country to meet the most severe competition which undoubtedly lay ahead of us.

Dr. Cullen responded.

MR. F. HERON ROGERS, president-elect, proposed the toast of "Our Guests," to which the HON. S. M. LANIGAN O'KEEFFE (High Commissioner for Southern Rhodesia) and MR. GILBERT S. SZLUMPER (president of the Institute of Transport) res-

Nitro-glycerine has a specific gravity of 1.60 at 15° C., but it has the most unfortunate property of freezing or crystallising at 13° C., when it becomes as hard as stone. The same happens to all explosives containing it and such explosives are most dangerous to handle when in this condition. In making nitro-glycerine to-day as an ingredient of explosives for use in countries which have a cold winter, the glycerine is admixed with a certain proportion of glycol and nitration proceeds in the normal manner. Explosives made from this mixed nitrate are designated "low freezing," "non-freezing," "polar," "arctic," etc., for they do not freeze at the ordinary winter temperatures and it may be said for cold countries they have entirely displaced the old product. Within recent years both of these nitrates have, to quite a considerable extent, been substituted by nitrate of ammonia, and this class has proved most effective in mining operations of all kinds.

Explosives, whether industrial or military, may have to be stored for very lengthy periods under alternating conditions of extremes of heat and cold; dampness and dryness; in the holds of ships or in magazines on land. It is, therefore, not surprising that not infrequently their physical structure deteriorates and this may be accompanied by chemical deterioration, a much more serious matter, for this, as the process gains in momentum, may lead to an explosion. Thanks largely to Sir Frederick Abel's research work, and that of many other workers throughout the world, the bugbear has, to a large extent disappeared, but it is still present and demands constant watchfulness in the manufacturing processes.

ponded. The toast of the "President" was proposed by DR. HERBERT LEVINSTEIN, Dr. Cullen responding.

Among those present were: Mr. and Mrs. S. J. Astbury, Lt.-Col. and Mrs. S. J. M. Auld, Mr. and Mrs. Horatio Ballantyne, Dr. and Mrs. W. T. K. Braunholtz, Mr. W. A. S. Calder, Mr. and Mrs. Francis Carnegie, Dr. and Mrs. C. G. Darwin, Maj.-Gen. and Mrs. A. E. Davidson, Engr. Vice-Admiral Sir Robert Dixon, Professor and Mrs. J. C. Drummond, Mr. E. V. Evans, Dr. and Mrs. J. Vargas Eyre, Dr. and Mrs. J. J. Fox, Mr. and Mrs. C. S. Garland, Mr. F. A. Greene, Sir Harold and Lady Hartley, Professor and Mrs. B. Jeppe, Dr. and Mrs. L. A. Jordan, Dr. and Mrs. L. H. Lampitt, Mr. and Mrs. Julian M. Leonard, Mr. William Macnab, Sir Allen and Lady Mawer, Sir Gilbert and Lady Morgan, Sir Robert and Lady Pickard, Mr. and Mrs. R. B. Pilcher, Mr. and Mrs. H. J. Pooley, Mr. J. Davidson Pratt, Mr. and Mrs. J. Arthur Reavell, Mr. and Mrs. Stanley Robson, Lt.-Col. H. S. Rogers, Mr. J. F. Ronca, Mr. and Mrs. William Russell, and Mr. and Mrs. H. C. Smith.

NEW X-RAY PHOTOGRAPHIC PLATES

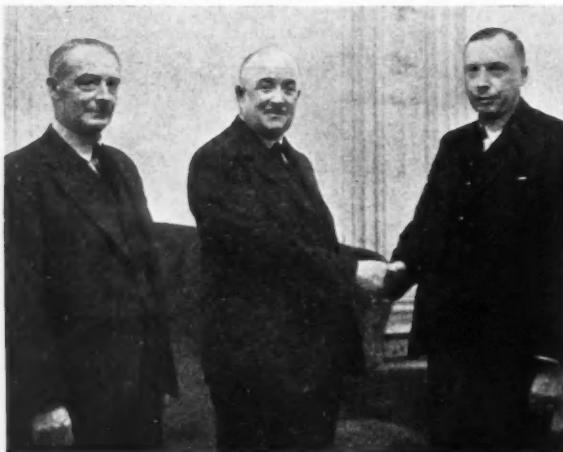
A patent taken out by the Etablissements Chenaille (F. P. 806,777) describes a new method of producing photographic plates for X-ray photography. At the present time, it is explained, plates are made with two layers of emulsion, each layer covered by a reinforcing screen which will turn the X-rays into light of a wavelength of the upper part of the spectrum. With modern emulsions it is possible to use slightly actinic substances which will produce light of a wavelength of more than 0.5 microns. The plate proposed is made by using a first layer of ordinary emulsion, covered by a screen of usual composition. This can be somewhat thicker than usual since the rays need not penetrate through it. Over this a second layer of emulsion, sensitive to green, is placed, and the whole covered with a second screen of an organic zinc salt which will give a green fluorescence. This also may be thicker than the normal tungstate screens, since it is transparent to X-rays. The possibility of using thicker screens, it is claimed, increases the sensitivity of the plates to X-rays.

Presentation of Perkin Medal to Mr. J. Baddiley

Medallist's Address on Post-War Developments in Dyestuffs Industry

AT a meeting of the Society of Dyers and Colourists at the Memorial Hall, Albert Square, Manchester, on February 17, the Perkin Medal was awarded to Mr. James Baddiley, of Imperial Chemical Industries, Ltd., "in recognition of his national services for the renaissance of the British dyestuffs industry through many important investigations in the field of colour chemistry conducted or directed by him." Mr. Baddiley is the twelfth recipient and the fifth Englishman to be honoured with an award. The medal is presented for outstanding work in the tinctorial and chemico-textile industries and is now regarded as the International Blue Riband of Honour in these industries.

Following the presentation of the medal, Mr. Baddiley gave an address on "Post-War Developments in the British Dyestuffs Industry" in which he expressed the opinion that the British dyestuffs industry was showing itself fully able to discharge the obligation under which it was placed when



Presentation of the Perkin Medal of the Society of Dyers and Colourists to Mr. J. Baddiley. Left to right: Mr. S. Heap, chairman of the Society; Mr. F. F. Flinn, J.P., president of the Society and Mr. J. Baddiley, medallist.

special steps were taken after the War to assist its development.

Great progress, he said, had been made in laboratory technique, such as the use of X-ray diffraction methods for determining molecular structure, optical diffraction in the visible and ultra-violet bands, and cathode-ray refraction which meant a sort of "electron microscope" with much greater resolving powers than the optical microscope. These were tools facilitating invention, and the general rate of progress was certainly as great as ever.

In the dyeing of cotton, substantial advances had been made, particularly with regard to light fastness. In the direct cotton colour field constant research had been given to straight-chain poly-azo dyes with 2-5-7 aminonaphthol-sulphonic acid and its derivatives as end-component, and this line of research had produced the biggest advances in this fast-to-light range. The Durazols are representative of direct cotton colours of high fastness to light.

With regard to the so-called "ice colours," Mr. Baddiley instanced the way in which production of reds had been raised from the lowest to one of the highest positions in the fastness scale, thus filling a serious gap in the range of dyes of guaranteed fastness.

Vat colours, which once appeared to be threatened by the new ice colours, had lived to prove the axiom that no dyestuff or group of dyes is ever completely knocked out by a new discovery. The two series were complementary.

Mr. Baddiley also spoke of the way in which colour

chemists had wrestled with the problem of discovering a general method of adding something to the molecular structure of an acid wool dye to improve milling fastness. He showed how endeavours along these lines had resulted in several useful novelties, the latest of which was represented by the Carbolan dyestuffs.

The dyestuffs chemist, affirmed Mr. Baddiley, had shown his ability to meet the problems presented by new artificial fibres very promptly. "In the early days of acetate rayon," he said, "chemists and dyers alike were reluctant to depart from the idea that solubility in water was a *sine qua non* in textile dyestuffs. Now, however, after years of development of the Duranol range comes the latest discovery of our laboratories—the Solacets, a series of truly water-soluble dyes, possessing high affinity and building-up properties and capable of being applied as though they were direct cotton dyes."

In regard to pigments, Mr. Baddiley mentioned the invention of the phthalocyanines in I.C.I. laboratories. These, he said, represented the last word in all-round fastness and in tinctorial properties.

Turning to textile auxiliaries, he outlined the fundamental principles involved in the modern "soapless" detergents, the success of which led to intensive research in long chain chemistry and the reduction of many new interesting products.

Mr. Baddiley concluded by enumerating other advances associated with the dyestuffs industry. He instanced photography, where the efficiency of the modern film, and especially of the colour film, was largely due to the use of dyestuffs. In the medicinal field, he said, the most outstanding discovery of recent years—sulphanilamide—was only a step removed from sulphanilic acid, the well-known dyestuffs intermediate.

Mr. Baddiley also mentioned the enormous improvement in all classes of rubber that had followed the production of new vulcanisation chemicals by closely related dyestuffs research and the close connection between synthetic polymers and the dyestuffs industry.

Letters to the Editor The Five Day Week

SIR—I was very interested to see that you are this year celebrating the 21st anniversary of the introduction into your business of the five day working week.

My company first adopted this system some 10 years ago, and has found no cause to reverse their decision; indeed it has been most successful in operation and is much appreciated by all concerned. Not only is the long week-end a greater opportunity for recreation, beneficial to the employees, but the system has proved itself economically sound.

I hope that the publicity which you are devoting to this matter, will lead to a more widespread application of the five day working week throughout the country.—Yours faithfully,

C. Shippam, Ltd.,
Chichester, Sussex.

CHARLES SHIPPAM,
Manager Director.

SIR—We inaugurated the five day week in our works in 1930, believing that it was more efficient for the firm and a popular move with the employees, giving as it does a much more satisfactory week-end rest.

The consequent difficulty in respect to office staff we solved by having fifty per cent. of the staff work alternate Saturday mornings.

These arrangements have proved beneficial to both the firm and the workers.—Yours faithfully,

L. SATCHWELL,
The Rheostatic Company, Ltd.,
Slough, Bucks.
Managing Director.

The British Industries Fair

Some Exhibits of Interest at Castle Bromwich, Birmingham

ENGINEERING SECTION

The display of the *Atlas Preservative Co., Ltd.*, on Stand D604 consists of mechanical models designed to demonstrate the elasticity and durability of Atlas Ruskilla iron and steel paints, together with coated specimens, test plates, etc. It is claimed that these products, by reason of the special medium employed in them, will stand up to conditions which would render ordinary paints too short-lived to prove profitable. They resist acid and alkaline fumes, steam and moisture and are thus suitable for chemical works where adequate protection from corrosion is essential.

Valves and Cocks

The *Audley Engineering Co., Ltd.*'s exhibits on Stand D329 include ranges of their Audco lubricated plug valves in cast iron, stainless steel, bronze, ebonite lined, cast steel, etc. They vary in size from $\frac{1}{4}$ in. to 14 in., and types are shown suitable for vacuum of 10^{-5} mm Hg. up to pressures of 3,000 lb. per sq. inch. Several three-way and four-way valves and cocks are shown, as well as typical examples of main, gland and air cocks, foot valves and strainers.

Among the new items exhibited for the first time is the Audco high pressure disc valve which is designed for test pressures up to 5,000 lb. per sq. inch. This valve incorporates the same principle of lubrication as is found in the company's range of lubricated plug valves, but in this instance it is adapted to surfaces which are flat instead of tapered. Replaceable seats are fitted, made of special alloys to resist erosion and corrosion, and troublesome glands are eliminated. The new Audco P.L. high pressure pump is specially designed for the oil industry, and has a capacity of from 8 to 210 gallons per minute at a pressure of 600 lb. per sq. inch. It is of the internal gear, one tooth difference, positive displacement rotary type, and is a heavy duty pump built for continuous service and long life with low maintenance costs. Forged steel type K3 valves, also exhibited for the first time, follow the Audco Lubriseald principle, and are fully lubricated and specially suitable for high pressure oil services, high pressure gas lines, hydraulic water services. They are manufactured from forged steel having a tensile strength of 55 tons per sq. inch, and are tested up to pressures of 6,000 lb. per sq. inch. They are made in sizes from $\frac{1}{2}$ in. to 2 in. In this type the valve plug is rotated by a separate stem which is attached to the plug through a floating equaliser fitted so that the two parts rotate together, but are independent as to lengthwise movement. By this means, lateral or sideways thrust of the plug by the line pressure is not transmitted to the stem, and turning is always easy.

New Boiler Accessories

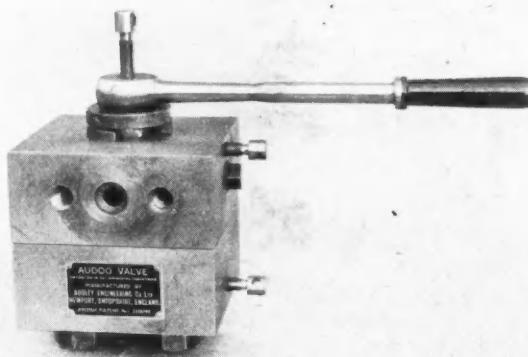
Babcock and Wilcox, Ltd., on Stand D401/300 show a number of new exhibits. They include the type "E" mill which has been developed to meet the need for a reliable and compact mill primarily for the direct firing of boiler furnaces. The mill is arranged with automatic control of its integral raw coal feeder and this enables output to be regulated by a single adjustment of the primary air fan damper. The Research Department exhibit is a new item designed not only to show the importance which the company place on research work, but also to demonstrate some of the results which have been achieved by it. In the centre of the display is a model approximately 4 ft. square in plan by 7 ft. high, of a pulverised fuel-fired high head boiler. Two new electrically-driven soot blowers are also shown.

Among the plant exhibited on Stand D611 of the *Britannia Tube Co., Ltd.*, are mild steel and stainless steel tubes in close joint, open joint and welded qualities, bent and straight; mild steel tubes cased with brass; aluminium and stainless steel; angles, channels and sections in mild steel

and stainless steel; seamless aluminium tubes to specification 4-T.9; and usual commercial quality in light gauges.

The *British Aluminium Co., Ltd.* (Stand D615 and 514) being the largest producer of virgin aluminium in the British Isles, a special feature is made of the standard forms in which the metal is produced in the company's various works. The stand itself is constructed to illustrate some of the many architectural and decorative applications of the metal. The surface finishes used include silver and coloured anodic films and sandblasting. Show-cases towards one end of the stand demonstrate some of the manifold uses to which aluminium and its alloys are now being applied, among them several recent developments of particular interest. Extruded sections in pure aluminium and aluminium alloys can now be produced in an enormous variety of shapes and sizes at a relatively low expenditure on tools. Special sections can therefore be provided to suit customers' individual requirements, and the exhibit is designed to show how these are finding increasing applications in chemical plant, etc.

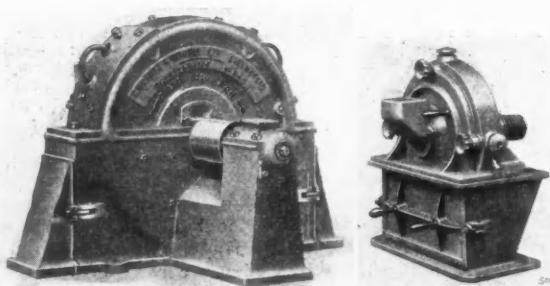
Attention has been concentrated on the newer techniques



A new Audco high pressure disc valve exhibited by the Audley Engineering Co., Ltd.

of oxy-acetylene welding and cutting, supported by a comprehensive display of equipment on Stand D411/312 of the *British Oxygen Co., Ltd.* The versatility of the oxygen flame cutting process enables steel plate 14 in. thick to be cut with the same ease as $1/32$ in. sheet. Heavy sections are carved into shapes, typical of the latest practise in roughing out and finishing large forgings, by a B.O.C. 55 in. Universal machine, which cuts through steel 14 in. thick at the rate of a foot in less than 5 minutes. The B.O.C. 36 in. and the portable straight line and circle cutting machines are seen at work on the preparation of steel plates for welding and stack cutting, in which a number of thin steel plates are clamped together and cut simultaneously. The new ultra-speedy hand cutter, designed to cut sheet metal down to $1/32$ in. thick cleanly and without distortion is also shown. New and improved techniques of oxy-acetylene welding such as rightward welding and Lindewelding are constantly being developed, and a number of these are demonstrated at regular intervals. A complete display of B.O.C. welding and cutting equipment is on view, together with a comprehensive range of welding rods and fluxes evolved by the company's technical and research departments and including new special bronze rods for the low temperature welding of copper and cast iron. The new Alda two-stage pressure regulators for oxygen and acetylene permit accurate control of pressures, especially in the lower ranges.

On Stand D401/300 the *Calorizing Corporation of Great Britain* are showing a few typical manufactures in their



A fixed beater disintegrator (left) and a beater cross disintegrator on pedestal stand (right) are two exhibits being shown by Christy & Norris, Ltd.

calorised mild steel and Calmet nickel chrome heat resisting metals, comprising heat treatment containers for casehardening, cyanide, salt and lead hardening and annealing, also pyrometer sheaths and superheater supports. Photographs are also shown of other manufacturers including calorised mild steel, nitrate of soda baths for the heat treatment of duralumin, parts for the aircraft industry, large wire and strip annealing pots, calorised steel tubes and Calmet alloy tube supports for oil cracking stills and calorised mild steel spiral conveyors, retorts, etc.

Christy and Norris, Ltd., show on Stand D221 a comprehensive range of their beater and hammer type grinders which may be used for a wide range of purposes. For chemical manufacturers the machines of most interest are the disintegrators which are of two main types. The separate fixed beater disintegrator is a useful general purpose mill and will grind almost any material in a dry state up to the hardness of a medium lime stone. Six sizes are available. The other type is the beater cross type, which may be supplied with water-cooled jacket and linings of non-ferrous material if this should be desired. Three commercial sizes are made and two laboratory sizes.

J. Collis and Sons, Ltd., on Stand D516 show an extensive range of types and sizes of the Collis truck, from a 5-cwts. model to one capable of lifting and carrying 50-cwts. on a 60 in. by 40 in. platform. Altogether, there are 64 models, thus catering for most floor transport requirements, all out-sizes and abnormal needs being satisfied by special designs. The heavy-duty Collis trucks are hydraulically operated. An adaptation of the same high efficiency mechanism is incorporated in the rigid frame, hinged head and telescopic frame types of the Collis portable stacker, exhibited with manual-hydraulic and electric-hydraulic units. The "brakeless" self-braking, the hydraulic lowering and raising of the hinged head and the almost inaudible electric-hydraulic drive are prominent features of the machine.

The Dunlop Rubber Co., Ltd., occupy Stand D511. Last year marked the 50th anniversary of the company's founda-

tion and the second half of its centenary has commenced with the firmly established reputation of 50 years experience in every branch of rubber manufacture. There is a comprehensive display of all types of mechanical rubber, including anti-corrosion rubber; protective linings for acid-resisting plants and Nerflex anti-corrosion buckets and jugs. This year a feature of particular interest is an A.R.P. display.

With the intention of exhibiting equipment which is of primary interest to the various branches of the chemical industry *Enamelled Metal Products Corporation (1933), Ltd.*, show on Stand D322 a complete glass-lined steel distillation unit, a glass-lined steel evaporating pan, a glass-lined steel Pre-Vak percolator, besides various types of storage tanks. The company's Pfaudler highly acid-resisting glass lined equipment is suitable for handling all mineral and organic acids with the exceptions of hydrofluoric acid and caustic alkalies. It is therefore fitted for the preparation of C.P. chemicals, dyestuffs, colours, pharmaceuticals and allied products. Resistant to the action of hydrochloric acid at all concentrations and at a variety of temperatures, Pfaudler equipment has been a great use to the manufacturer of chlorinated organic compounds where the mortality of ordinary equipment is high and the quality of the resultant product sometimes questionable. This glass lined equipment can be used wherever metallic contact is undesirable.

A representative selection of *Thos. Firth and John Brown, Ltd.*'s well known steel products are on display at Stand D619/518. The engineers' tool department is fully represented by a range of files, machine tools, etc. The heavy side of its manufactures are represented by die blocks and a range of castings, while other examples of a general character include various applications of nitalloy steel noted for its extreme hardness and use in parts subject to hard wear.

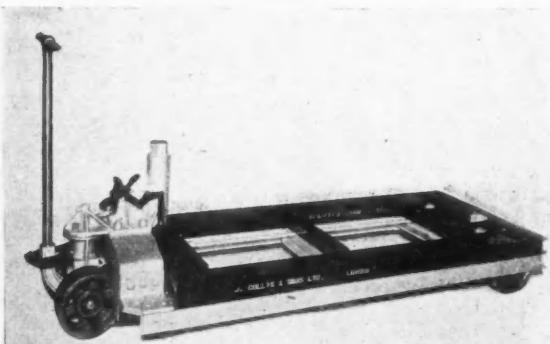
Corrosion and Heat-Resisting Steels

A complete range of Firth-Vickers corrosion and heat-resisting steels known by the trade marks "Staybrite" steel and Firth stainless steel are on view at *Firth-Vickers Stainless Steels, Ltd.*, Stand D413/314. "Staybrite" steel is of the austenitic type and embraces a wide range of steels for different purposes and to various analyses. It is now used extensively throughout all industries where cleanliness, hygiene coupled with strength and immunity from corrosion are essential. The products of the company are represented by "Staybrite" and stainless steel bars of various sizes, "Staybrite" steel sheets of different finishes, forgings, castings, cold rolled strip and drop-stampings.

On Stand D323 *Girdlestone and Co.* display their patent electric diaphragm pumps for dealing with acidulated and corrosive solutions. All parts of this pump which come into contact with the liquid with which it is dealing can be supplied in various metals and materials such as "Staybrite" steel, Monel metal, etc. The salient features of this pump are positive self priming with empty suction pipe and without foot valve, suction lifts up to 22 ft. vertical, etc.

Harry Heymann, Ltd., on Stand D715 are showing a range of carboy tipplers, fitted with side tipping bar and brake. The company's carboy barrow is so constructed that by levers attached to shaft handles the carboy is lifted from the floor and may be wheeled to any desired position: then by a twist of the handles it can be dropped to the floor level. There is no necessity to lift or even touch the carboy itself. The Monopol self-priming syphon is made in 27 different styles and materials; for example a lead syphon for transferring concentrated sulphuric acid from carboys.

I.C.I. (Metals), Ltd., show on Stand D403/302, brass and other alloys of copper in the form of plates, sheet, strip, wire, rod and sections; strip and sheet in copper and its alloys in various sizes and gauges, and a selection of rods and extruded sections which indicate the wide range of the company's products. Also featured is "Everdur," a copper with the strength of steel, which has made great headway since the last Fair, particularly in the manufacture of boilers, cylin-



J. Collis & Sons, Ltd., are the manufacturers of this heavy-duty truck which is designed to lift and carry a five-ton load.

ders, storage tanks and heaters and for all purposes connected with water conveyance. Special attention is drawn to the ease with which "Everdur" can be welded by oxy-acetylene, carbon arc or resistance methods. Various forms of the material are shown to demonstrate the extraordinary properties of the alloy and its many potential applications. Exhibits of interest to those engaged in constructional work include expansion jointing which is finding a considerable outlet in concrete construction; "Kudapro," copper strip for damp-proof courses, and "Terrabond" serrated strip for terrazzo flooring.

The I.C.I. metal degreasing exhibit, *Stand D305*, contains a demonstration of a totally enclosed rumbling plant ingeniously designed to cut down the solvent consumption to a minimum. It is possible to see the process in operation by means of a sight glass. Two degreasing plants selected from the standard range are also shown. One of these is a "Popular" type—the smallest plant on the standard range—and the other an LV2 model which gives both vapour and liquor treatment. Both these plants are seen in operation.

On the I.C.I. Heat Treatment of Metals and Case Hardening stand (*D204*) gas-heated furnaces and electrical furnaces are shown in operation to demonstrate the following salt bath heat treatment processes: Rapideep for deep carburising; cyanide for shallow carburising and general heat treatment; tempering salts for low temperature operations such as colouring of steel; and hardening of high speed steel in carboneutral consisting of pre-heating, hardening and quenching in molten salt.

Industrial Recording and Controlling Instruments

George Kent, Ltd., on *Stand D.621* are exhibiting a comprehensive range of their manufactures, covering automatic control and meters that can be used for the practical operation of power plant and industry. For automatic boiler control, the Master controller, furnace pressure controller and fuel air ratio controller are shown mounted on panels. The KM steam meter gives an accurate record of steam flow on a 12 in. chart and can be supplied with an integrator if required. The RS/C rotary shunt steam meter extensively used for process steam measurement gives a clear reading of the total amount passed and is simply bolted into the steam pipe between two flanges. The exhibit of this meter is in section. Ring balance gas meters are shown and also shunt gas meters.

For the first time the new Mark II Multelec temperature controller is on view. This instrument embodies all the features of the Mark I instrument and in addition has 10 inches of visible chart and a bold scale. This instrument can also be seen at work on the stand of Birmingham Electric Furnaces, Ltd. A special display is arranged to show the use of the Multelec for recording both the discharge and quality of trade effluent. The Multelec is being used in many industries for controlling temperature and pH and for recording CO₂ and electrolytic conductivity.

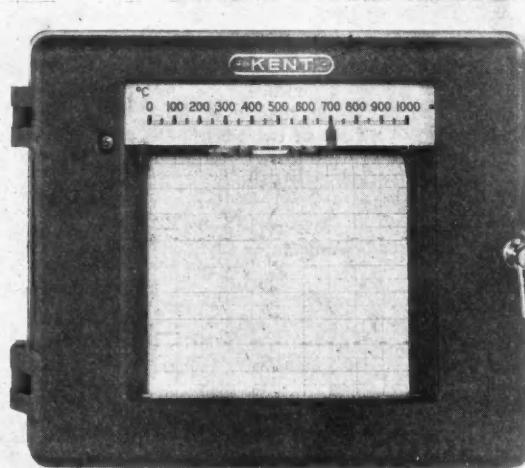
David Moseley and Sons, Ltd., are exhibiting on *Stand D630* rubber roller coverings, rubber gloves, hose of all types, anti-corrosive rubber products and a large number of mechanical moulded goods. Their chief exhibit comprises an anti-corrosive ebonite pipeline, complete with an ebonite-covered and rubber-lined tank together with motor and pump.

Buckets and measures, hydro-extractors, bends, pipes and branches, plunger pumps and taps are among the products manufactured by the company in which extensive use is made of the non-corrosive properties of vulcanite.

Newalls Insulation Co. (a branch of *Turner & Newall, Ltd.*) are exhibiting on *Stand D521* a complete range of thermal and sound insulation materials divided into three sections: (a) heat; (b) cold; (c) sound. The "heat" section includes exhibits of Newalls 85 per cent. magnesia and "Newtempheat" high temperature products, together with their "Empire" type 85 per cent. magnesia sectional pipe covering designed especially for the insulation of hot water piping. The company have now established a new fire protection product known as moulded asbestos. They also manu-

facture four grades of insulation bricks covering a range of temperatures up to 2,450° F.

Two types of gas heaters are among the Needle products shown by *Newton, Chambers and Co., Ltd.*, on *Stand 502/603*. One is for connecting into the gas main and the other for bolting direct on to the side of the purifier box, both types being of cast iron construction throughout. It is customary to use the first type as a primary heater, that is a heater which is capable of raising the temperature of the whole gas supply from say 40° F. up to 90° F. The second type is used for additional heat to the gas to compensate for the losses which occur when the gas is passing through the various boxes. The company also exhibit an economiser which is of the self-contained steel cased type suitable for building on top of existing chimney flues. The model shows how the economiser may be built up in conjunction with the air heater since both types of element have the same width of flange and may accordingly be cleaned with the same soot blower. A Newton Needle recuperator is shown arranged for use with a furnace, and this particular one is shown arranged in a horizontal chimney flue. The Needle recuperator is used for preheating both gas and air required for combustion on any type of furnace. For working with waste gas temperatures up to 1,100° C. and air temperatures up to 750° C., the elements

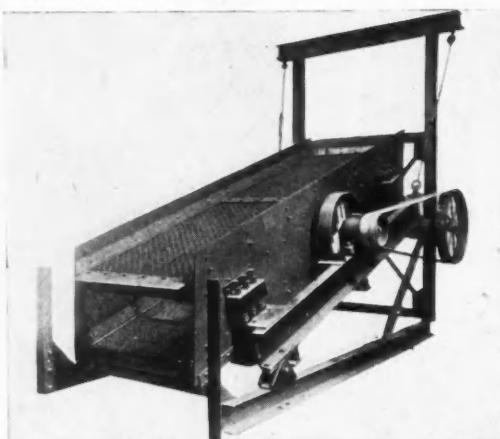


The new Multelec, Mark II, temperature recorder-controller manufactured by George Kent, Ltd.

are cast from a 35 per cent. chrome mixture; for lower temperatures, say 850° C. on the waste gas side, and 450° C. on the air side, they are cast from special heat resisting iron. A Newton Needle air heater exhibited is of a type suitable for working in conjunction with any type of steam boiler. The particular unit shown illustrates how the air heater may be mounted in the same setting as the economiser.

Coke fired "Newcotherm" heaters, gas-fire "Newcotherm" heaters and a high-pressure economiser are other products of interest on show.

On their *Stand D308 Niagara Screens (Great Britain), Ltd.*, show several examples of their latest industrial screening equipment. In the Niagara screen the material is kept continually on the move, both in a vertical and horizontal direction, so that open apertures in the screening cloth are effectively maintained. Positive vibrations are generated by a high speed eccentric shaft, the vibrations set up being confined to the machine itself. The eccentric shaft in the Niagara screen is made from high grade steel accurately turned to size. Bearings are of the roller type, amply proportioned and effectively protected against dust or grit. The screen basket and chassis are built up from best quality M.S. plates and sections and welded to ensure a rigid structure. Niagara screens are made in a large range of sizes with either



An example from the range of Niagara industrial screening equipment.

one, two, three or four decks, and may be driven by motor or from lineshaft through belt or vee ropes.

The O.C.P. Marketing Co., who are exhibiting on Stand D718 are featuring the O.C.P. process for the electrical conditioning of water required for use in boilers and other industrial purposes. The principle of the electrical conditioning of water is that a series of electrodes situated in the storage tank through which the water flows produces an electrical effect which brings about a physical change in the salts contained in the water. As no chemical action takes place, the equipment is in no sense a water softener, but the water, when used in boilers forms no scale, an easily disposed of soft sludge being deposited instead. The O.C.P. installation consists primarily of one or more teak containers carrying the electrodes and accommodated in the storage tank. The water is led into the containers and passes out through the tubes into the tank.

On Stand D624 Siebe, Gorman and Co., Ltd., are exhibiting new types of oxygen breathing and resuscitating apparatus as used in gas works, chemical works, etc., gas masks of the latest types, dust masks, safety gloves and goggles, asbestos and protective clothing for all purposes, safety belts and A.R.P. equipment.

Steel Flooring Plates

The main exhibit of Stelcon (Industrial Floors), Ltd., on Stand D207 is Stelcon Anchor steel plates. These are stampings made from 10 gauge steel, and the overall size is approximately 12 in. by 12 in., with half plates approximately 12 in. by 6 in. available in order to break joint. Each plate is bent at the sides to a depth of about $\frac{1}{2}$ in. On the surface and sides of Stelcon Anchor steel plates 53 lips are stamped out, and these form anchors going in eight different directions, so that when the plates are laid every three square inches is securely anchored to the concrete bedding material. An immovable, all-steel floor of great durability is thus provided. Stelcon plates are dustless, very easily kept clean, and are intended for floors where traffic is abnormally heavy or where heavy objects are handled.

John Thompson (Dudley), Ltd., who, with associate companies, exhibit on Stand D513/410, are specialists in the manufacture of chemical and foodstuffs plant, and are represented by a boiling pan fabricated in stainless steel. Similar type vessels are made but with internal portion of Inconel, Monel metal or nickel, according to requirements. The mild steel jacket is welded on by special methods so that it will not affect the corrosion-resisting properties of the pan. Another exhibit of the company is a vertical sterilisation retort. These retorts can be fitted with cooling systems and controls for equalisation of temperature.

The most striking feature of the United Steel Companies

Ltd.'s Stand D613/512 is the extent to which stainless steel figures in the construction. The outside walls and doors of the commodious lounge consist of satin finished stainless steel sheet, and the six display counters are surrounded by bold strips of stainless steel. The whole stand is dominated by an illuminated tower bearing the United Steel Companies' emblem also fabricated in stainless steel. The stainless steel used is the "Silver Fox" new process stainless steel.

The exhibits shown on the stand serve to illustrate the main activities of this organisation. They include examples of electric steels and special alloy steels, steel strip and wire and special irons and forgings.

An extensive range of "Lion" packings, jointings and mechanical rubber goods for all pressures and temperatures of steam, fluids or gases is shown on James Walker and Co., Ltd.'s stand (No. D422).

BUILDING SECTION

Apart from the supply of steel equipment for works and offices, G. A. Harvey and Co. (London), Ltd. (Stand B327), are well equipped for the production of various types of specially designed plant in stainless steel, copper, Monel, nickel, etc., used in the chemical industry and kindred trades. The plant installed at their works enables riveted and electrically welded work of all descriptions to be fabricated. There is an extensive range of Harco perforated metals for all kinds of sifting, filtering and grading on this stand, and woven wire cloth of all meshes and gauges and in all metals. Harco Tapergil gilled tubes, of interest to all concerned with heat transfer problems, are displayed in long lengths of varied diameters and pitch of gills. The Harco mild steel Tapergil tube is a new departure in gilled tubing and has an efficiency or rate of heat transfer approximately 25 per cent. greater than for a crimped gill tube.

F. Hulc and Co., Ltd., are making a special feature of bitumen Silvercote on Stand B600. This finish gives a light reflecting surface and at the same time protects the material to which it is applied. It is claimed to have a large covering capacity (one gallon covering 750 sq. ft.).

Sand spun pipes 16 ft. long of the socket and spigot, turned and bored types, and with flexible joints are shown by the Staveley Coal and Iron Co., Ltd. (Stand B517/416). Cast iron pipes (vertically cast) 9 ft. and 12 ft. long of these types are also shown. Pipes can be supplied concrete lined and/or bitumen coated. Other exhibits on this stand include wood wool for all packing purposes and chemicals and by-products in wide variety.

Two sections of the three sectioned Stand B401 of the Valor Co., Ltd., are devoted respectively to Valor fire extinguishers and Valor steel equipment for offices and works. The company's range of steel equipment has recently been extended; different styles of tables and desks and also a multi-drawer card index cabinet are of special interest in this connection.

The Yorkshire Copper Works, Ltd., display on their Stand B723/632, non-ferrous tubes in all qualities, namely, copper, brass, aluminium, cupro-nickel, Yorcalbro (aluminium brass), phosphor bronze, block tin, etc. Yorkshire fittings for water services, heating, gas waste services and pipe lines of every description are a special feature of the display. Yorkshire fittings contain the correct amount of solder to make a perfect joint, and only require the application of flux and heat to make the joint.

GAS SECTION

A full-sized conveyor bright annealing furnace (Incandescent Heat Co., Ltd.) is seen at work on Stand Ca 611/514 of the British Gas Federation. The "gas tube" principle of gas firing which is used in the bright annealing exhibit takes the place of the muffle system of firing and is used only where the load must be kept separate from the products of combustion. The "gas tube" or radiant tube, is a heat resisting metal tube, in this case about $1\frac{1}{2}$ in. in diameter, inside

which the gas and air are burned. The tube becomes incandescent transmitting heat to the load by radiation and convection without the necessity of heating up an outside combustion chamber and so wasting valuable heat. A pot furnace (Brayshaw Furnaces and Tubes, Ltd.) for the medium temperature heat treatment of metals in which the permissible temperature variation is very small and recirculation of the furnace atmosphere is essential is also shown on the stand. The gas rate is controlled by a bimetallic thermostat and a two-point recorder (Elliott Bros., Ltd.) registers the exact state of the load. The more everyday uses of gas are represented by an open fired furnace (Gibbons Bros., Ltd.) for general heat treatment with an automatic control panel (Cambridge Instrument Co., Ltd.) and by a new recuperative crucible furnace (Constructional Engineering Co., Ltd.) for melting non-ferrous metals. A new gas furnace control panel is also shown for the first time.

The main feature of Stand *Ca511* of *Gibbons Bros., Ltd.* is a series of illuminated photographs depicting various plants erected by the firm during the past year. They include several of the well known "Gibson-Kogag" coke oven plants, views of completed ovens and jobs under construction being shown. Various furnace installations are on view including types for sheet annealing, reheating, malleable annealing, enamelling, etc. The company are again showing a full range of their refractories, the various types available being sufficiently comprehensive to cover the bulk of industrial needs.

A speciality is made by *Moxey Conveyor and Transporter Co., Ltd.* (*Stand Ca704*) of coke and coal handling, screening, cutting, and storage plants for gas works. Their patent balance reciprocating screen for gas works, collieries, etc., forms the main feature of their exhibit.

The *Oxley Engineering Co., Ltd.* (*Stand Ca713*) specialise in the erection of arc welded purifiers, spiral guided gas-holders and other gas works plant. In connection with purifier construction, two Hollis patents may be seen, these being a leak detector and fastener, and a working model of a Quick-Grip fastener. This fastener is also suitable for low pressure vessels other than purifiers. Other exhibits are samples of homogeneous lead coating and sprayed limpet asbestos. Welded test pieces are also on view.

Various samples of high-grade refractory bricks and blocks suitable for withstanding high temperatures in retort settings, coke ovens, iron and steel works, etc., are shown by the *Stourbridge Refractories Co., Ltd.* (*Stand Ca612*). They are also showing a range of special refractory insulating bricks, special hot patching cements both in the dry powdered and plastic form, and samples of jointing mixture for fireclay and silica work.

ELECTRICITY SECTION

An exhibit of *Bakelite, Ltd.* (*Stand Cb408*) illustrates the ability of paints based on bakelite resin to resist attack by normally corrosive agents. Several metal plates are shown protected with finishes based on a bakelite resin and these are automatically immersed in, and withdrawn from, a 5 per cent. solution of caustic soda. It is seen that bakelite resin paints are virtually unaffected by the treatment. Among other exhibits are bakelite oil and spirit soluble synthetic resins and the new primer bases. These latter enable non-lifting primers to be manufactured capable of drying out completely in 20 minutes. Liquid and plastic cements for various purposes, synthetic stoving lacquers for bright metals and glass, and bakelite sealing solution are other features of the company's display.

The *British Thermostat Co.*'s stand (*Cb700*) has been designed to afford a setting for a number of panels on which are mounted examples of Teddington automatic controls for heating, air-conditioning, refrigerating and industrial installations. A comprehensive range of room thermostats and duct thermostats, humidistats, magnetic and motorised valves and motor-operated damper units are shown. A special feature is the new model HS Teddington humidistat, which incorporates many improvements over the original HH model.

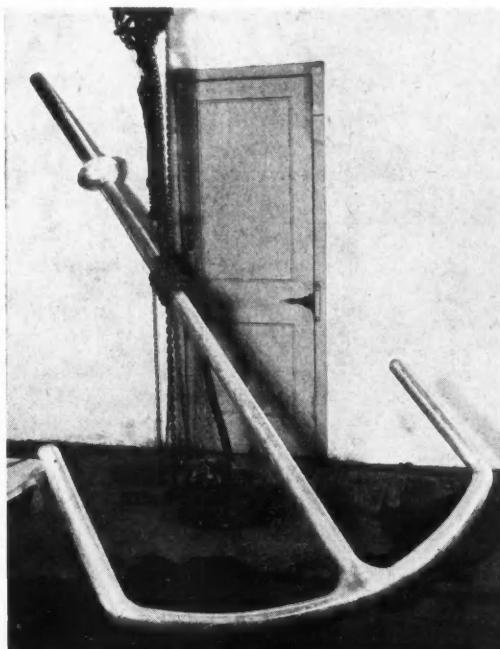
This instrument is an automatic switch which responds to changes in relative humidity, irrespective of the prevailing temperature, and can therefore be employed for the direct control of humidifying and drying units. An extensive selection of refrigeration controls is exhibited. The Teddington controlling pyrometer, manufactured by Teddington Controls, Ltd., an associate company of the British Thermostat Co., Ltd., is shown for the first time. This instrument is claimed to be the simplest controlling pyrometer hitherto produced. It is suitable for a wide range of industrial applications, and may be used for the control of electric furnaces of all types and, in conjunction with magnetic or motor-driven valves, damper units and the like, for controlling fuel-fired furnaces. Specimens of seamless metallic bellows, in various materials, are displayed, together with a selection of mechanism in which they are employed.

Gas Recorders

James Gordon and Co., Ltd., are showing their type E motor operated Mono recorders on *Stand Cb716*. The Simplex Mono CO_2 recorder is guaranteed to have an accuracy equal to that of the Orsat. The instrument requires no water supply and is simple in maintenance. The Duplex Mono Combustion Recorder (CO_2 and $\text{CO} + \text{H}_2$) has the same attractive features of the Simplex and in it the various functions of the double-reading instrument have been reduced to simplicity itself. In addition, the company are also showing their Igema distance water level indicator and various regulators dealing with the Hagan system of automatic boiler control, steam pressure and temperature control, etc.

Higgs Motors, Ltd., are showing on *Stand Cb619* a representative selection of electric motors of all types and sizes from 1/8th horse-power to approximately 100 h.p. In addition there are a number of the component parts used in building up motors and also the company's motor geared units. There are also several complete gearboxes running showing the various low speeds to which the firm's standard motor speeds can be reduced. This year, Higgs Motors are showing for the first time both as complete motors and in parts, their new patent low starting current squirrel cage machines, as well as two examples of their new patent variable speed three phase commutator motors.

Johnson, Matthey and Co., Ltd. (*Stand Cb308*) are again



[By kind permission of Monsanto Chemicals, Ltd.
A silver covered steel agitator made by Johnson,
Matthey & Co., Ltd.

exhibiting a complete range of the standard types of platinum laboratory apparatus and apparatus for micro-chemical analysis. Of interest to the chemical engineer are many examples of the growing use of 99.97 per cent. pure silver as a lining or sheathing for pans, condensers, heating or cooling coils, stirrers, etc., which have to deal with corrosive liquors. Staybrite steel gauze, as a mechanically strong and chemically inert means of filtering or screening, and platinum and silver gauze for catalytic purposes are also on view. More prominence is being given this year to the company's cadmium products. There are displayed a large range of cadmium and selenium light and heat resisting pigments for use in the manufacture of glass, paint, rubber, printing ink, synthetic resins, etc., and cadmium electro-plating salts. In recent years the company has carried out intensive investigation into the use of silver alloys for metal jointing purposes. The use of these silver solder alloys is actually demonstrated on the stand.

The three main exhibits of *Metalectric Furnaces, Ltd.*, (Stand Cb605/504) are an electric box type general heat treatment furnace 20 kva rating for annealing, carburising, and reheating, and operates under conditions of extreme economy at all temperatures up to 1,000° C.; a vertical air circulation furnace, a unit suitable for operation at all temperatures up to 700° C.; and a model electric steel melting furnace, a replica of a 12/15 ton capacity *Metalectric-Tagliari* 3-phase direct arc type melting furnace.

The *Rheostatic Co., Ltd.*, (Stand Cb411/310) are exhibiting a comprehensive range of space heating controls including

room thermostats and motorised valves, together with a range of immersion thermostats for the control of liquid temperatures. There is also shown a complete control panel such as would be installed in a large building and taking care of the entire heating plant so far as automatic control and automatic temperature indication is concerned. This panel will also incorporate a change-over relay whereby control is transferred to stand-by plant in the event of breakdown on any of the essential services. A further feature is the *Satchwell* compensator control which is an all-electric device for application to central heating installations whereby the flow water temperature is automatically raised or lowered according to whether cold or mild weather conditions prevail.

Electric furnaces of many different types ranging from laboratory muffles to furnaces for industrial use are exhibited by *Wild-Barfield Electric Furnaces, Ltd.*, and *G.W.B. Electric Furnaces, Ltd.* (Stand Cb303/204). For high speed steel hardening three equipments are exhibited. The first is a small twin-chambered unit for toolroom use; the second is a larger unit comprising two separate furnaces, both of greatly improved construction and appearance; and the third an electrode salt bath which incorporates many novel features designed to give safe and efficient operation. For low temperature treatments below 700° C. two sizes of vertical forced air circulation furnaces are shown. One furnace fitted with the charge progress recorder is intended for production, the other smaller model of simplified design for tool-room and experimental purposes. The furnaces manufactured by *G.W.B. Electric Furnaces, Ltd.*, are too large to exhibit, but numerous large photographs of installations are on view.

Further Notes on Exhibits at Olympia

THE Chemical Section at Olympia is in the same prominent position to which it was allocated in the re-arrangement of the various sections carried out for last year's fair. It is probably more advantageously placed than any other section for it is immediately opposite the Addison Road entrance and thus cannot escape the attention of anyone entering that way. The individual stands in the section do not, however, occupy the same places as last year and this by itself helps to strike the right note of novelty. Further, most of the stands have been changed in design, and while they may or may not be an improvement on those of last year they are *different* and strike the visitor as generally more pleasing than those of any other section at Olympia. Further brief notes on the exhibits are given below; these are supplementary to those published in last week's issue.

The central position on the stand of *Baird and Tatlock (London), Ltd.*, is occupied by a most modern type laboratory bench complete with all fittings and reagents. Special features of the bench include the use of rods for fixing apparatus, thus dispensing with retort stands, an illuminated milk-glass panel let into the bench surface for observing the colour changes in titrations, and two ovens with a wide temperature range (20-280° C.) and stainless steel linings mounted back to back in the centre of the reagent shelves. Among the laboratory apparatus exhibited are different types of centrifuges (of particular note is the Baragry centrifuge which is of very flexible construction, has a capacity of 500 grams and rotates at 7,000 revs. per minute), super-distilled water apparatus, ovens, muffles, Orsat gas analysis apparatus, Bone and Wheeler apparatus, and bomb colorimeters. Examples of the company's extensive range of balances are shown, the new B.T.L. aperiodic balance of sensitivity 1/10 milligram and capacity 20 grams being outstanding among these. This model has a geared release mechanism fitted with two handles and the scale is illuminated automatically on dropping the beam supports. A button switch is provided for illuminating the scale in adjusting the balance when the beam is at rest.

Such a wide and varied range of products, many of them

recently introduced, is shown by *A. Boake, Roberts and Co., Ltd.*, that it is difficult to single out particular items for comment. But, in addition to the description of the exhibits already given, mention must be made of a series of copper soaps which are finding increasing applications as insecticides and in the textile industry and of the aluminium stearates. These latter are supplied in a number of grades with different metal contents and it is found that their properties such as melting point, gel rigidity, and specific volume vary almost directly with the metal content. Among their uses are in flattening, waterproofing, as fillers and sealers, and in thickening mineral oils to form greases. Guaiacol is found among the new pharmaceuticals and Antiviray used in various anti-sunburn cosmetics is now available in a water-soluble form. Another new product of interest is propenyl guaethol, an anti-oxidant for oils and rubber.

An exhibit of Stilboestrol is prominent on the stand of *Boots Pure Drugs Co., Ltd.*, together with transparencies showing the comparative activities of natural and synthetic oestrogens. Jecocin, a medicated castor oil containing amyl meta cresol, is also exhibited for the first time. Stilboestrol is also shown prominently by *The British Drug Houses, Ltd.*; this material represents a great achievement, that of producing mineral oils to form greases. Guaiacol is found among joint stand of *The Distillers Co., Ltd.*, *British Industrial Solvents, Ltd.*, and *The Methylating Co., Ltd.*, is one of the most attractive in the chemical section. The exhibits include samples of finishes based on Epok synthetic resins and materials impregnated with Epok thermo-hardening resins, different forms of Distrene glass-clear thermoplastic resin shown for the first time last year, and a new product, Lymn pure salt which is a vacuum dried grade supplied by a subsidiary company, Charles Moore and Co., Ltd. A chart shows the different solvents derived from alcohol.

In connection with the work the *General Chemical and Pharmaceutical Co., Ltd.*, have done in respect of reagents to meet the needs of individual industries, interest attaches to the specimens they show of Judex α -naphthylamine and of Judex sulphuric acid specially prepared for the Griess-

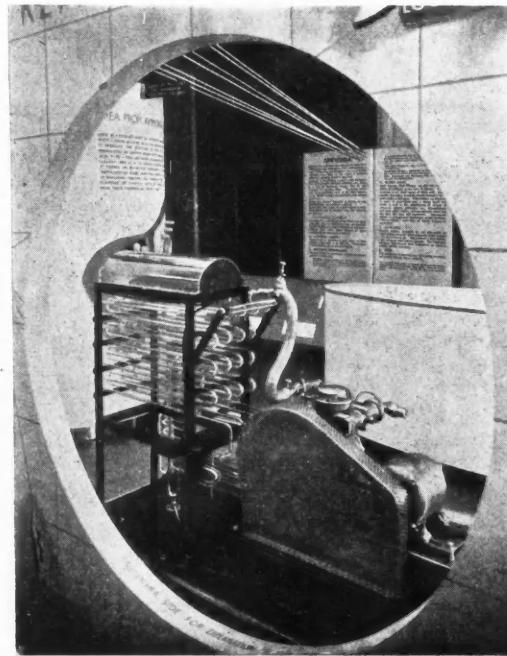
Ilosva's test—this is in view of the work which is at present being undertaken in connection with toxic gases in industry.

A new series of soaking and knitting oils, Sol-Ester oils, for the silk hosiery trade are exhibited by *Howards and Sons, Ltd.*, and other noteworthy exhibits on this stand are viscose transparent wrapping paper with a synthetic resin coating plasticised with cyclohexanol acetate, extruded rods of casein plasticised with sodium lactate, and a vinyl acetate moulding powder plasticised with Barkite.

Precious metals in all forms and their compounds are on the stand of *Johnson, Matthey and Co., Ltd.* Samples of gold and silver electro-plating salts are shown and of more particular interest to the chemical trade is the use of silver on base metal in plant such as boiling pans. Platinum gauze for catalytic purposes, platinum laboratory apparatus, and samples of iridium, osmium, palladium, rhodium and ruthenium ores and metals are displayed as well as fine tubes fabricated in precious metals. Many photographic devices have been used in the past by *Johnson and Sons, Manufacturing Chemists, Ltd.*, for the walls of their stand and this year they again use photography. The slogan on the wall is "the sun never sets on Johnsons chemicals" and this is depicted by sun rays penetrating clouds and shining on the world and some large photographic studies of the packed developers manufactured by the company. There is also a series of photographs showing various parts of the firm's works at Hendon. A spectacular exhibit is made of silver nitrate crystals in a large evaporating basin.

A striking exhibit of *Thomas Tyre and Co., Ltd.*, is formed by a new series of fluorescent and luminous salts for use in luminous paints, advertising devices, etc. An ultra-violet light cabinet on the stand shows the beautiful effects obtained. Among new products shown may be mentioned iron ammonium citrate (green gran.).

In addition to the new products of *Whiffen and Sons, Ltd.*, already described, there are two further new products being shown which are of note. These are trimethylcetylammmonium bromide for the froth flotation of minerals and atropine



A refrigeration model seen through the ironical display of the I.C.I. stand at Olympia. The exhibit illustrates the many uses of ammonia.

methyl nitrate of value in pyloric stenosis. Williams (Hounslow), Ltd., show Nubian Black, a new dyestuff to take the place of the German Soudan product and a range of dyestuffs (Varnol) for spirit varnish. The Varnol dyestuffs are characterised by extremely high fastness to light; some members of the range can also be used in cellulose lacquers.

Ageing of Lubricating Oil

Types of Asphaltic Formations Produced

L. G. SABROU and E. M. Renaudie, in a report to the French Academy of Sciences (*Compt. Rend.* 207, 1,050) have reported some interesting observations made on lubricating oil during ageing tests laid down by the Ministry for Air (Norm. Air, 1933-1933) in which the oil is heated to 150° C. for 40 hours. Microscopic examination of the oils showed that while at the beginning the oils were of an orange colour with no solid matter in suspension, at the end of the ageing process asphalt found in the oil samples took different forms: (1) a flaky brown mass covering the whole field of vision, sometimes with aggregations of the flakes into solid masses; (2) ovoid brown or black grains either isolated, agglomerated into masses or in chains, dispersed throughout the oil; (3) short, fine needles of a more or less translucent nature; and (4) rare spots of any of the above three types of formation, or in some samples no presence of asphalt at all. It was noticed that an oil might have two or more of these types of formation, either mixed together or more generally in layers, one being formed near the bottom and the other at the top of the oil. Chemical and viscosity tests showed that the amount of asphalt and the viscosity were related to the microscopic appearance of the oil. Tests made at intervals showed that an oil passes through each of these stages as ageing progresses. The fourth type of formation is the first stage of ageing and as ageing proceeds, needles are formed. These later grow into grains and finally the whole of the oil becomes covered with a flaky asphaltic formation. It was found that if the ageing were carried on for 24 hours, no further asphalt was formed.

Cork-Rubber and Cork-Neoprene Compositions

Two Materials of Versatile Applications

DEVELOPMENTS in the applications of Kautex and of Neo-K-Tex are described in the current number of *Plastics* (1939, 3, 20, 22-24). Kautex itself was developed about five years ago and essentially is a composition in which the desirable properties of cork and the strength of rubber are combined by mixing 75 per cent. of cork granules (the size of granule depending on the use to which the composition is to be put), with 25 per cent. of ordinary crêpe rubber. In the compounding, a low temperature vulcanisation process is employed so that the cork is not damaged. The natural resins in the cork appear to protect the rubber against oxidation. The product, while not so strong as rubber, has a longer life, shows no permanent set, has a lower specific gravity, a higher electrical resistance and frictional surface, and is considerably less costly. It is moreover a very versatile composition, since various other substances such as asbestos, wood flour, and graphite can be incorporated, so that new uses are continually being found for it.

Neo-K-Tex has been developed quite recently, and is obtained by substituting Neoprene for rubber. This material is highly resistant to the solvent action of oils, petrol, and water, and is hence a very suitable material for all packings and gaskets in car and aero engines. Mixed with a large amount of asbestos it has been found to have a 40 per cent. higher frictional value than the normal material in use for the clutch lining of motor cycles. As a covering for the feed rollers in spinning mills, it has been found to be very advantageous.

Chemical Matters in Parliament

Scientific Research—Tax Rebate

IN the House of Commons on Tuesday Mr. Markham asked the Chancellor of the Exchequer whether he would consider the expediency of relieving money spent on scientific research in industry of the burden of Income Tax by instituting a rebate on moneys so expended.

Sir J. Simon replied that Mr. Markham would not be correct in assuming that in no circumstances would expenditure incurred by an industrial concern on research for the purposes of its business be admissible as a deduction in computing its profits for Income Tax purposes. If he had any particular case in mind, and would let him know the facts, he (Sir J. Simon) would gladly look into it and communicate to Mr. Markham the result of his inquiries.

Oil Extraction

In the House of Commons on the same day Mr. G. Macdonald asked the Secretary for Mines the total production of oil from coal in Great Britain during the latest year for which figures were available; what proportion was that of the total oil consumption in this country, and what steps were being taken to increase the home production of oil.

Captain Crookshank, in reply, stated that the latest figures available were those for 1937, and particulars would be found in his last annual report. For motor spirit the home production represented about 7 per cent. of the home consumption. As figures were not available of the amount of heavy oils which were used as fuel, the percentage figure for those oils could not be stated, but it would be negligible. As regards the last part of the question, the Finance Act of last year implemented the principal recommendation of the Falmouth Committee which was designed to encourage further development work.

Mr. Macdonald: Is the Minister satisfied that the Government cannot do anything more than is being done to encourage this industry?

Captain Crookshank: We discussed that question at considerable length on the Finance Bill last year, and a preference was given to home-produced oil.

Coloured Pottery Glazes

Successful Application of Lithium Carbonate

THE successful use of lithium carbonate in glazes has been accomplished by Richardson (*J. Amer. Ceram. Soc.*, 22, 50-53). The usual type of glaze composition used to produce coloured glazes by the incorporation of heavy metal oxides, suffers from the defect that the alkali is usually introduced as a soluble salt, which renders the effects produced to some extent uncertain, as the rate of evaporation becomes a factor which tends to make the distribution of alkali non-uniform.

Using lithium carbonate alone to replace completely all the alkalies, it was found quite easy to prepare a satisfactory blue glaze (copper base) with improved characteristics. This composition, however, contained about 30 per cent. of lithium salt, and the cost would be prohibitive. It was therefore sought to develop glazes in which the lithium should be replaced to some extent by sodium and potassium, in the form of cryolite and feldspar. As a result of several trials a mixture was evolved in which 32 mol per cent. of the lithia was replaced by Na_2O , 7 mol per cent. by KNaO , and 20 per cent. by CaO (as whiting) reducing the lithia content of the glaze to 12 per cent., and thus making it an economic proposition. These lower lithia content glazes can contain unusually high proportions of clay, whiting, and feldspar—ingredients usually considered detrimental to the properties of the finished glaze. The colour characteristics of the glazes obtained are an improvement on those obtained using soluble alkalies.

RECENT TRADE LITERATURE

FHULSE & CO., LTD., have issued a brochure in connection with their product "Silvercote" which gives a non-tarnishing, non-corroding coat of metal on application. Apart from its protective properties, "Silvercote," it is claimed, reflects light to such an extent that as much as 20 minutes use of artificial light has been saved in a factory by treating roofs and girders with the material. Photographs showing a variety of objects to which "Silvercote" can be applied are given in the brochure which gives, also, details of Bitumen "Silvercote." The latter provides a silver light-reflecting, non-tarnishing outer metal layer, with bitumen underneath, and has been used with success in chemical and dye works where fumes destroy ordinary paints.

W. H. ALLEN, SONS AND CO., LTD., Bedford, have commenced publication of the *Allen Engineering Review* which they intend issuing every three months for the main purpose of establishing contact with engineers and machinery users throughout the world interested in the generation of mechanical and electrical power and the application of pumping plant to all services. The first issue contains 20 pages, and introduces a policy which includes the publication of articles contributed by engineers concerned in the particular class of machinery on which their activities are concentrated, such as oil engines, steam turbines, steam engines, pumping plant, condensing plant, etc.

A 40-page book entitled, "Cold Weather Care of Acetylene Generating and Distributing Equipment," published by THE LINDE AIR PRODUCTS CO., contains valuable suggestions for the proper maintenance of acetylene generators and associated equipment subject to freezing. This book presents an explanation of how to prevent freezing of acetylene generators, hydraulic back-pressure valves, distribution piping and hose, regulators, relief valves, and water-cooled blowpipes, together with suggestions for procedures where freezing has occurred. Charts and tables provide a quick reference to anti-freeze requirements for hydraulic back-pressure valves. Copies may be obtained from The Linde Air Products Co., 205 East 42nd Street, New York, N.Y.

ABAIR ENGINEERING, LTD., consultants and suppliers of air conditioning plant, have issued an attractive, illustrated brochure which gives details of the company's plants and also describes the many uses of air conditioning for comfort and air conditioning in industry. The Abair Company are sole licensees for the patented capillary cell which is now fitted standard to most Abair installations. The capillary cell, which was invented by Walter Fleisher, a pioneer of air conditioning, and chairman of research (1938) of the American Society of Heating and Ventilating Engineers, is described in the brochure. Abair installations roughly group themselves under three headings:—The central type which weather conditions a whole building; the zone or multi-room type which air conditions a single suite of offices; and the unit type which is suitable for a single room.

The use of sulphur dioxide for various bleaching operations, for the treatment of tan extracts, sugar, etc., and in refrigerating plant, has greatly increased, and new requirements for preservatives occur frequently. While the liquefied gas can be obtained in bottles it is expensive, and presents difficult problems for storage and handling. For this reason the KESTNER EVAPORATOR AND ENGINEERING CO., LTD., have standardised sulphur burners of two types, the High Efficiency (Prentice Patent) and the General Utility pressure type, in a range of sizes to meet every requirement however large or small. In a leaflet No. 254 issued by the company the two types of sulphur burner are described. The High Efficiency (Prentice Patent) type is a burner designed to give sulphur dioxide of high concentration with freedom from sublimed sulphur. The General Utility pressure type burner is designed primarily for the production of relatively small quantities of sulphur dioxide required intermittently.

Foreign Chemical Notes

Belgium

THE SOUDOMETAL S.A. has been registered at Forest-lez-Bruxelles with a capital of one million francs.

Holland

A NEW PLASTIC MATERIAL based upon potato meal is now being manufactured in opaque and transparent forms.

Japan

THE HODOGAYA SODA K.K. is now turning out calcium cyanide for fumigation purposes at the rate of 5 tons per month.

Poland

A FACTORY IS TO BE BUILT AT ORLOWO for the purpose of producing iodine from sea algae, as a sequel to experimental work on the Baltic shores.

Switzerland

A NEW METHOD OF VISCOSE RAYON DYEING is based upon the addition of dye to the viscose before spinning. The colours of the resulting yarn are said to be fast to the action of soap, chlorine and perspiration. The fabrics also possess an increased wet strength.

Finland

THE SUOMEN SELLULOIDI O.Y., the formation of which is announced at Helsinge (Southern Finland), with a capital of 100,000 Finnish marks (which can be raised to 150,000 marks) will engage in the manufacture and distribution of celluloid and insulating materials.

France

NEW GOVERNMENT REGULATIONS relating to the composition of motor spirit containing lead tetraethyl stipulate a maximum content of 0.3 part lead tetraethyl per 1,000 parts by volume of spirit.

THE SAINTE-LUCIE LEAD MINES near Marvejols in the Department of Lozère are to commence production in the near future. The ore is reported to be highly argentiferous and to contain lead tungstate.

Greece

BY A MINISTERIAL DECREE it is now permissible to preserve the juices of fruits of the orange family with 0.15 per cent. formic acid.

"COMPANY FOR CHEMICAL AND PHARMACEUTICAL PRODUCTS, TRADE AND INDUSTRY" (which will be known in short as "A.E.Y.I.Ch.") is a new concern with interests in the chemical, pharmaceutical and perfumery field and has been registered in Athens with a capital of 300,000 Dr.

Italy

PLANT IS BEING ERECTED AT ROSOLINA (Rovigo) for the extraction of methane from natural gas issuing from wells in the district.

A NEW FACTORY FOR THE PRODUCTION OF TARTARIC ACID PRODUCTS was recently started up at Marsala in Sicily. Erected under the auspices of the Soc. An. Vinicola Italiana of Turin, the factory is capable of turning out 1,000 tons of potassium bitartrate and 500 tons of calcium tartrate per annum.

Russia

TELLURIUM MANUFACTURE has been commenced at the Pyschma electrolytic copper works.

PRODUCTION OF NATURAL RUBBER from the kau-sagis plant is reported to have been four times greater in 1938 than in 1937.

THE PODSEMGAS TRUST is starting work this year upon two new underground coal-gasification plants. The plant for underground gasification of lignite in the vicinity of Moscow is nearing completion and is expected to be in operation early in the year.

Personal Notes

MR. ANTHONY E. LOWTHER has joined the board of the Workington Iron and Steel Co., Ltd.

MR. SAMUEL MARKS, retired oil refiner, who was formerly associated with the Anchor Oil Works, Glasgow, has left net estate valued at £10,872.

DR. EDWIN GREGORY, lecturer in metallurgy at Sheffield University, is relinquishing that post to become chief metallurgist to the Park Gate Iron and Steel Co., Ltd., at Rotherham.

LIEUTENANT-COLONEL E. F. W. MACKENZIE has been appointed director of water examination to the Metropolitan Water Board. Lieut.-Col. Mackenzie has held a number of military appointments in connection with sanitary and hygiene work, and in 1936 he was awarded the Parkes Memorial Medal and prize for investigations into the ammonia-chlorine process of water purification and research work in connection with food supplies in India.

MR. WILLIAM SETTEN GILLES, consulting chemist, late managing chemist at Courtauld's silk factory, Bocking, has left estate valued at £101,057 (net personalty £97,784). He bequeathed £500 to the Benevolent Fund of the Institute of Chemistry, and after other bequests, one-fourth of the residue each was left to the Clothworkers' Company for the establishment of research fellowships in science and to the research fund of the Chemical Society.

DR. AMULYARATAN CHAKRAVARTI, Research Fellow and consulting biochemist, B.I. Research Laboratories, Calcutta; BIRENDRA N. GHOSH, Professor of Pharmacology, Carmichael Medical College, Calcutta; WILLIAM MAIR, retired manufacturing chemist, Edinburgh; and DR. G. M. STEWART, Professor of Physiological Chemistry, Glasgow University, are among the candidates who have been recommended for election on March 6 to the Fellowship of the Royal Society of Edinburgh.

OBITUARY

MR. WILLIAM REID, late of Thomas Reid and Sons, soap manufacturers, died recently at Prestwick, Ayrshire.

SIR EDMUND DAVIS, a director of Turner and Newall, Ltd., and of a number of mining companies, died on Monday at the age of 76.

MR. ARTHUR SHAW, C.B.E., general secretary of the National Union of Dyers, Bleachers and Textile Workers, died on Tuesday at the age of 59.

PROFESSOR HENRY LOUIS, one of the best-known mining and metallurgical experts in Britain, formerly Professor of Mining and lecturer on metallurgy at Armstrong College, died on Wednesday at the age of 83.

MR. FRANK E. PARKINSON, youngest and last member of Mr. Richard Parkinson, founder of the firm of manufacturing chemists, Parkinsons, Ltd., died last week on his 70th birthday. He had been connected with the firm of Parkinsons, Ltd., all his life, having acted for many years as a departmental manager.

MR. CHARLES BURT ROBINSON, chairman of the Midland Tar Distillers, Ltd., since 1931, died last week at the age of 72. Mr. Robinson became secretary of Robinson Bros., Ltd., tar distillers, West Bromwich, 40 years ago, and when the company disposed of its tar distillery interests to the Midland Tar Distillers, Ltd., in 1923, he joined the board of the latter company.

General News

THE BRITON FERRY STEEL Co., LTD., have commenced operating their mills again after a long period of idleness.

BARROW, HEPBURN AND GALE, LTD., announced at a recent company meeting held in London that they had suffered a loss on the working of their gelatin factory at Beverley, due to falling prices.

DR. C. S. FOX, OF THE GEOGRAPHICAL SURVEY OF INDIA, addressing a meeting at the Indian Museum, Calcutta, expressed the opinion that the greatest future for the Indian coal industry was in the preparation of cheap smokeless fuel for household use and in recovering the primary tar and gases in the process of distillation. The tar would be far more suitable than coal for hydrogenation at moderate temperature and low pressure for benzine production.

INDUSTRIAL A.R.P. knowledge should be pooled and manufacturers well advanced with shelter construction and evacuation plans should pass on the benefit of their experience for the good of the industrial community as a whole. This suggestion is made by E. K. Cole, Ltd., radio manufacturers, of Southend-on-Sea, who initiate the scheme by offering, to all industrial executives, full constructional details and plans of the shelters they have built for 3,000 employees, together with information on evacuation routine and training.

THE JANUARY SHIPMENTS OF CHINA CLAY show that the new year has opened well and hopes are being experienced that the United States Trade Pact will revive some of the lost china clay trade to that country. January shipping included:—from Fowey, 37,273 tons of china clay, 2,085 tons of china stone, 1,322 tons of ball clay; Par, 11,128 tons of china clay, 535 tons of china stone, 1 ton of ball clay; Charlestown, 1,849 tons of china clay, 827 tons of china stone; Padstow, 394 tons of china clay; Plymouth, 156 tons of china clay; Newham, 15 tons of china clay; Rail, 5,562 tons of china clay. The total amounted to 61,147 tons, compared with 42,742 tons in January, 1938.

DURING THE MONTH OF JANUARY, 1939, offers of contributions towards rent, rates and income tax were made to five industrial undertakings to induce them to set up factories in the Special Areas of England and Wales. At the end of the month, the total number of completed factories on the Team Valley Trading Estate was 103, of which 92 were occupied and in production, employing 2,151 people. On the South Wales Trading Estate at Treforest the total number of completed factories was 42, of which 37 were occupied giving employment to 1,040 people. A further 17 factories were under construction for tenants and negotiations for other tenancies were in progress. The Commissioner's total commitments at the end of January in respect of all the Special Areas in England and Wales were approximately £18,086,000. The total expenditure involved, excluding the capital brought into the Areas by new firms being established on the trading estates and elsewhere, was more than £24,000,000.

THE MOST ENCOURAGING INDICATIONS in the test borings for oil in different parts of Great Britain have been found in Mid-Lothian, according to Mr. G. W. Lepper, B.Sc., technical adviser to H.M. Petroleum Department, who lectured on "The Search for Oil in Britain" at a meeting of the Scottish branch of the Institute of Petroleum, held in the Royal Technical College, Glasgow, on February 16. In their No. 1 well near Couston, Mid-Lothian, said Mr. Lepper, the D'Arcy Exploration Company (Anglo-Iranian Oil Company) had proved valuable gas supplies, exceeding 10,000,000 cu. ft. per day. Numerous non-productive oil-impregnated sandstones were penetrated. A second well, half a mile west of No. 1, was now being drilled, and the derrick for a third had been erected. Mr. Lepper added later that though at present there were only four holders of oil-boring licences in Scotland that number would probably be doubled in the near future. (It is interesting to note that three more petroleum prospecting licences were issued by the Board of Trade this week to the D'Arcy Exploration Co., covering an area of 197 sq. miles in the County of Lancaster, 46 sq. miles in the counties of Derbyshire, Leicestershire and Staffordshire, and 145 sq. miles in Yorkshire. One licence has also been granted to the Anglo-American Oil Co., covering an area of 149 sq. miles in Fife and Kinross.)

From Week to Week

EMPLOYEES OF THE LoTHIAN CHEMICAL WORKS have asked the Transport and General Workers' Union at Edinburgh for permission to take strike action in support of demands for higher wages and better conditions.

THE MANCHESTER CHEMICAL CO., LTD., have had plans prepared for extensions to their works at Mill Street, Manchester. It is proposed to erect a new three-storey building adjoining the works, which will about double the existing floor area.

THE ASSOCIATION OF BRITISH CHEMICAL MANUFACTURERS have published Supplement No. 2 to the second edition of the Index to Acts of Parliament and Statutory Rules and Orders Affecting the Chemical Industry. The supplement contains items noted by the Association during 1938.

AN INFORMAL LUNCHEON was held under the auspices of the British Chemical Plant Manufacturers' Association on February 14, at which Swedish chemical engineers, who were visiting this country, were present as guests of the Association. An interesting discussion followed the luncheon and it is hoped that this direct contact will prove a useful means of opening up a market in Sweden for British chemical plant.

THERE IS A GREAT DEFICIENCY OF SULPHUR IN INDIA, and large quantities have to be imported. Mr. Kapilram Vakil, a well-known Bombay chemist, has asserted that the ultimate and final source of sulphur, sufficient to meet all the requirements of India would be sea water. From the chemical and technical standpoint no insuperable difficulties would be met with but the chemical engineering aspect of the process required considerable investigation, particularly in regard to capital and working charges.

SPEAKING AT THE ORDINARY GENERAL MEETING of Borax Consolidated, Ltd., on Tuesday, Mr. D. Abel Smith (the chairman) stated that the general interest in the prospects of a new outlet for boron in agriculture continued unabated and the reports received had been so favourable that they were drawing nearer to the time when, as had been indicated previously, it might prove highly desirable to include a small proportion of borax with the fertilisers normally applied to a number of crops. One Continental market already absorbs over 1,500 tons of borax a year for its sugar beet crop.

THE PRAGUE FAIR, having been in the centre of interest of numerous foreign buyers as the leading market for Czechoslovakian commodities for several years, has a serious task to solve this spring. It has to give a thorough survey of the production programme of the country within its new frontiers and especially of the productive capacity of its export firms. A most complete participation of all industrial branches has been guaranteed and the exhibitors will prove that Czechoslovakia is able to keep its outstanding position in the world trade. The next Prague Spring Fair will be held from March 12 to 19 next.

AT THE CONVERSAZIONE HELD BY THE PHARMACEUTICAL SOCIETY on February 14, Apex Construction, Ltd., showed a Stokes tablet machine fitted with a variable speed drive. This new feature allows the machine to be run at the optimum rate for every tablet formula. Speed variation is obtained by operating a hand wheel and adjustments are made while the machine is running. A new Stokes model 171 automatic water still was also shown. This model is available for steam, gas or electric heating. The still is built of copper chromium plated, with pure tin condenser tubes. The preparation of granules for tablet manufacture by "slugging" was also demonstrated.

MR. W. H. McCONNELL, chairman of Synthetic Oils, Ltd., speaking at the annual meeting of the company last week, drew attention to the completion of a plant on the company's own site near Bedlay, which would enable them to confirm actual figures of yield and cost on a commercial scale of a process for producing synthetic oil from water gas. This plant, he said, was a self-contained unit. A full-sized commercial plant would consist of a multiplication of units of similar design, and these would naturally function in the same way as the Bedlay unit. He added that this plant, to deal with 200,000 cu. ft. of gas per day, was started in its work in December last and performed in the most exemplary way.

Chemical and Allied Stocks and Shares

UNDER the influence of the belief that no material increase in taxation will be made this year, the industrial and allied sections of the Stock Exchange have shown a strong rally this week. Prices were marked up sharply in many instances, but the volume of business, although larger, did not show any substantial increase.

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Shares of companies identified with the chemical and kindred industries moved strongly in favour of holders as a result of the more cheerful market conditions. Imperial Chemical were active around 32s., which represents a further improvement of 9d. on the week. The market expects that the preliminary statement for the past year's working will be issued about the middle of next month. British Oxygen moved up from 71s. 3d. to 73s. 9d. while Distillers were considerably higher at 92s. 9d. In view of the more hopeful views as to the provisions of the Budget, the market is now inclined to expect that the distribution of the last-named company may be maintained at 22½ per cent. A short while ago the general belief was that the payment might be limited to 20 per cent.

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Imperial Smelting were active and are 12s. 3d. at the time of writing, compared with 11s. 6d. a week ago. The market is assuming that the application for an increase in the duty on foreign imported zinc is likely to be granted and that the company's prospects will be improved as a result. Enfield Rolling Mills remained active on the hope that dividends may be commenced this year. Pinchin Johnson were good and have risen from 26s. to 27s. 6d., while among shares of other paint manufacturers, both International Paint and Indestructible Paint were firm, awaiting the forthcoming dividend announcements.

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Cement shares continued to attract rather more attention on the assumption that demand for cement will improve owing to A.R.P. schemes. Associated Cement were in request and are

74s. 1½d. at the time of writing, compared with 70s. a week ago. British Plaster Board were slightly higher at 27s. Stewarts and Lloyds were firm among iron and steel securities, there being continued hopes in the market that the dividend may be raised to 15 per cent. Colvilles and Baldwins were also firmer, awaiting the dividend decisions which are also due shortly. Murex were higher at 77s. 6d. and Birmid Industries were active.

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British Oil and Cake Mills preferred ordinary were steady at 41s. 6d., pending the past year's figures. Lever Bros. and Unilever rallied to 34s. 3d. Results of the latter company are due in April and the general assumption is that the 10 per cent. dividend may be maintained, although it is realised that for dividend purposes profits are pooled with those of the Dutch associated company and that conditions on the Continent have been difficult for the business of the latter.

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Borax Consolidated were lower on balance, but have been steady at around 22s., since the statements at the meeting. Boots Pure Drug were higher at 40s. 7½d., while Sangers, despite moderate fluctuations, are unchanged on balance at 21s. Timothy Whites and Taylors at 24s. 9d., are within 3d. of the price current a week ago. Courtaulds have risen strongly on the week and are 28s. 3d. at the time of writing, sentiment having been influenced by the increase in rayon prices. British Celanese issues also improved. Wall Paper deferred units rallied to 32s. 6d.

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"Shell," Anglo-Iranian and most other oil shares responded to the more cheerful market conditions. Attock Oil shares were active on expectations that the maiden dividend may be 7½ per cent. In some quarters a slightly higher rate is expected, but the directors have stated that only a moderate payment is likely to be made this year.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Complete Specifications Open to Public Inspection

PRODUCTION OF HALOGENS.—E. Viel. July 31, 1937. 22881/38.

PROCESS FOR THE MANUFACTURE OF CONDENSATION PRODUCTS.—I. G. Farbenindustrie. Aug. 3, 1937. 23001/38.

MANUFACTURE OF α -HALOGEN VINYL METHYL KETONES.—I. G. Farbenindustrie. Aug. 3, 1937. 23002/38.

CRYSTALLISATION OF ALKALINE EARTH METAL NITRATES.—Azogeno Soc. Anon., and C. Toniolo. Aug. 4, 1937. 23035/38.

PROCESS FOR THE MANUFACTURE OF β -INDENE ACETIC ACIDS.—I. G. Farbenindustrie. Aug. 4, 1937. 23094/38.

PRODUCTION OF DERIVATIVES OF p-AMINO-BENZENE-SULPHONAMIDE. Naamlooze Vennootschap Orgaehemia. Aug. 6, 1937. 23104/38.

PROCESS FOR THE MANUFACTURE OF PURE HYDROCARBONS of the benzene series and apparatus for carrying out this process.—Niederschlesische Bergbau, A.-G. Aug. 5, 1937. 23218/38.

UNSATURATED CARBONYL COMPOUNDS.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. Aug. 6, 1937. 23385/38.

PREPARATION OF STABLE AND INJECTABLE ORGANIC CALCIUM SALT SOLUTIONS.—J. A. Wulffing. Aug. 6, 1937. 23386/38.

Specifications Accepted with Date of Application

PRODUCING CATALYSTS FOR BENZINE SYNTHESIS.—W. E. Evans (Ruhrchemie, A.-G.) May 1, 1937. (Convention date not granted.) 500,182.

MANUFACTURE OF CAPILLARY-ACTIVE COMPOUNDS.—W. W. Groves (I. G. Farbenindustrie.) April 27, 1937. (Samples furnished.) 499,879.

PROCESS FOR THE MANUFACTURE OF SHAPED ACTIVATED CARBONS. I. G. Farbenindustrie. May 9, 1936. 499,956.

PREPARATION OF CATALYSTS and catalytic reactions of hydrocarbons.—A. Wassermann. May 25, 1937. 499,958.

PROCESS FOR THE MANUFACTURE OF UNSATURATED KETONES of the cyclo-pentano-polyhydrophenanthrene series.—Schering-Kahlbaum, A.-G. June 2, 1936. (Samples furnished.) 500,186.

COLOURING NITROGENOUS MATERIALS.—W. W. Groves (I. G. Farbenindustrie.) June 25, 1937. 499,868.

TREATMENT OF TEXTILES.—E. Butterworth, B. P. Ridge, Frazer and Haughton, Ltd., and Imperial Chemical Industries, Ltd. June 28, 1937. 499,873.

MANUFACTURE OF INSECTICIDAL COMPOSITIONS.—B. Collie, S. Ellingworth, A. Robertson, and Imperial Chemical Industries, Ltd. June 30, 1937. 500,197.

MANUFACTURE OF QUINOXALINE DERIVATIVES.—Soc. of Chemical Industry in Basle. Aug. 1, 1936. 500,196.

DYEING OF CELLULOSE MATERIAL.—J. G. Evans, H. A. Piggott, R. J. W. Reynolds, J. D. Rose, E. E. Walker, and Imperial Chemical Industries, Ltd. June 30, 1937. 500,110.

RECOVERY OF ELEMENTARY SULPHUR from sulphur dioxide and gases containing same.—Metallges, A.-G. Aug. 10, 1936. 500,041.

PROCESS FOR THE MANUFACTURE OF SULPHONIC ACID AMIDE COMPOUNDS.—A. Carpmael (I. G. Farbenindustrie.) July 29, 1937. 500,118.

DRY DYESTUFF PREPARATIONS.—D. A. W. Fairweather, and Imperial Chemical Industries, Ltd. July 30, 1937. 500,120.

BLEACHING OF TEXTILES.—E. Butterworth, J. A. M. W. Mitchell, Fraser and Haughton, Ltd., and Imperial Chemical Industries, Ltd. July 30, 1937. 500,121.

MANUFACTURE AND PRODUCTION OF HIGH MOLECULAR WEIGHT SUBSTANCES.—G. W. Johnson (I. G. Farbenindustrie.) Aug. 4, 1937. 500,211.

MANUFACTURE OF HYDROCARBONS by reaction between carbon monoxide and hydrogen.—H. Dreyfus. Aug. 5, 1937. 500,264.

MANUFACTURE OF N-METHYLSULPHITES and N-methane-sulphinic acid salts.—W. W. Groves (I. G. Farbenindustrie.) Aug. 6, 1937. 500,224.

POLYMERISATION OF ORGANIC COMPOUNDS.—Distillers Co., Ltd., H. M. Stanley, G. Minkoff, and J. E. Youell. Aug. 9, 1937. 499,969.

PROCESS FOR PRODUCING GREEN PATINA on copper and its alloys. W. H. G. Vernon, and E. G. Stroud. Oct. 20, 1937. 499,907.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Argentina.—An agent established at Buenos Aires wishes to obtain the representation for Argentina, on a commission and consignment basis of United Kingdom manufacturers of chemicals, drugs and pharmaceutical products. (Ref. No. 160.)

Uruguay.—H.M. Consul at Montevideo reports that the Uruguayan State Electricity Supply and Telephones Administration is calling for tenders, to be presented in Montevideo by April 24, 1939, for the supply of 240,000 kilos of lubricating oils. Firms desirous of offering oils of United Kingdom manufacture can obtain further details of this call for tenders upon application to the Department of Overseas Trade, 35 Old Queen Street, London, S.W.1. (T.Y. 18946/39.)

Commercial Intelligence

the following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

ALBERT PRODUCTS, LTD., Erith, manufacturers of resins, fibres, gums, etc. (M., 25/2/39.) February 9, mortgage and charge to Midland Bank, Ltd., securing all moneys due or to become due to the Bank; charged on land, hereditaments and premises at Erith, also general charge. *£4,000. March 26, 1938.

BRITISH ALUMINIUM CO., LTD. (M., 25/2/39.) February 3, disposition by Whinnyhall Estate Co., Ltd., with consent of this company, granted in implement of a Trust Deed dated September 12, 1934, to secure an issue of £3,500,000 debenture stock; charged on lands and estate of Whinnyhall, Burntisland. *£3,500,000. April 12, 1938.

J. C. DOVEY, LTD., Bath, colour manufacturers. (M., 25/2/39.) February 9, £550 debentures, general charge.

RICHARD THOMAS AND CO., LTD., London, W.C., steel tipplate manufacturers. (M., 25/2/39.) February 7, £253,000 $\frac{1}{2}$ per cent redeemable prior lien debenture stock, part of an amount already registered. *£8,620,410. August 11, 1938.

Satisfactions

B. E. N. PATENTS, LTD., High Wycombe. (M.S., 25/2/39.) Satisfaction February 13, of charge registered March 14, 1933.

CURRIE AND HUTCHINSON, LTD., Newcastle-on-Tyne, manufacturing chemists. (M.S., 25/2/39.) Satisfaction February 8, of charge registered December 22, 1931.

STEWARTS AND LLOYD'S, LTD. (incorporated in Scotland). (M.S., 25/2/39.) Satisfaction February 14, of debenture stock registered February 8, 1934, to the extent of £13,800.

County Court Judgments

RILEY, ANTHONY, 59 Maida Vale, W.9. (C.C., 25/2/39.) Research chemist. £26 13s. 2d. October 19.

HENLEY, S., The Bungalow, Chaseley Road, Etching Hill, Rugeley. (C.C., 25/2/39.) Analytical chemist. £10 5s. 2d. January 11.

BASEBE, CECIL DONALD, 6 Edwin Road, Hastings. (C.C., 25/2/39.) Manufacturing chemist. £12 14s. 0d. January 6.

Chemical Markets

LONDON.—Quite a good volume of inquiry for general chemicals has been in evidence during the week both for home trade and export, although the number of firm buying orders actually put through has been on a moderate scale. Ex-contract deliveries are being taken up in fair quantities and the movement in this respect is regarded as satisfactory. So far as the price position is concerned there are no important changes to record and values in all sections of the general chemical market remain steady at recent levels. A fair home trade has been passing in Coal Tar products, transactions, however, being mainly confined to quantities that are no more than sufficient to meet spot or nearby requirements. A few export inquiries have been received, but there is still an absence of interest in fresh contract business. Values throughout the market remain steady with quotations perhaps a little firmer.

MANCHESTER.—A slightly better tone in respect of deliveries of heavy chemicals against old contracts has been reported in one or two directions on the Manchester market during the past week. The call for supplies of textile dyeing and finishing materials both from the cotton and woollen sections is reported in some quarters to have been on a somewhat improved scale, and some measure of improvement has been experienced in one or two other branches. So far as new business in chemicals is concerned, however, orders placed this week have been mostly for moderate quantities. Prices in most cases are on a steady basis. Among the tar products the light distillates are attracting most attention and values of these are maintained.

Books Received

Volumetric Analysis. By A. J. Berry. 5th edition. London: Cambridge University Press. Pp. 193. 7s. 6d.

Intermediate Chemistry. By T. M. Lowry and A. C. Cavell. London: Macmillan & Co., Ltd. Pp. 876. 12s. 6d.

Handbook of Food Manufacture. By F. Fiene and Saul Blumenthal. London: Chapman and Hall, Ltd. Pp. 603. 25s.

Forthcoming Events

February 20-March 3.—British Industries Fair. London: Olympia and Earl's Court. Birmingham: Castle Bromwich.

London

February 27.—Royal Society of Arts. John Street, Adelphi, W.C.2. 8 p.m. Sir Gilbert Morgan, "Achievements of British Chemical Industry in the last 25 Years."

March 1.—Society of Public Analysts. Burlington House, Piccadilly, W.1. 8 p.m. Institute of Chemistry. 30 Russell Square, W.C.1. 8 p.m. Annual General Meeting.

March 2.—Sir John Cass Technical Institute. Jewry Street, Aldgate, E.C.3. 6.30 p.m. "Spectroscopic Analysis."

Institute of Metals. C. H. Schneider, "New Methods of Working Metals."

Royal Institution. 21 Albemarle Street, W.1. 5.15 p.m. Dr. C. G. Goodeve, "Photochemistry."

The Chemical Society. Imperial College, Imperial Institute Road, South Kensington, S.W.7. 5.30 p.m. Symposium on "Microtechnique in Organic Chemistry," opened by Professor I. M. Heilbron.

March 3.—Royal Institution. 21 Albemarle Street, W.1. 9 p.m. Sir William Bragg, "Liquid Films."

Society of Public Analysts. Institute of Chemistry, 30 Russell Square, W.C.1. 5 p.m. Annual General Meeting.

Sir Henry Dale, "Biological Standardisation."

British Association of Chemists. London Section. Dinner and Dance. Piccadilly Hotel, W.1.

March 4.—Royal Institution. 21 Albemarle Street, W.1. Sir William Bragg, "Crystals of Organic Substances."

March 6.—Society of Chemical Industry. Joint meeting with the Food Group. Burlington House, Piccadilly, W.1. 8 p.m. W. Godden, "Trace Elements in Human and Animal Nutrition."

March 7.—Royal Institution. 21 Albemarle Street, W.1. 5.15 p.m. W. L. Bragg, "The Chemistry of the Solid State."

March 8.—Electrodepositors' Technical Society. Northampton Polytechnic Institute, St. John Street, E.C.1. 8 p.m. Symposium on "Behaviour of Commercial Anodes."

March 8 and 9.—Institute of Metals. Institution of Mechanical Engineers. Storey's Gate, S.W.1. 10 a.m. (8th) Annual Dinner. 7 p.m. Grosvenor House, Park Lane, W.1.

Birmingham

February 27.—Chemical Society. Joint meeting with the Birmingham University Chemical Society. The University, Edgbaston. 5 p.m. Professor E. L. Hirst, "The Molecular Structure of Starch."

March 7.—Electrodepositors' Technical Society. James Watt Memorial Institute, Great Charles Street. 7.30 p.m. A. W. Wallbank, "Electrodeposition of Various Metals on Zinc Alloy Die-Castings."

Bristol

March 2.—Society of Chemical Industry. The University, Woodland Road. 7.30 p.m. Annual Meeting. A.C. Monkhouse, "Air Pollution and Some of its Problems."

Glasgow

March 3.—Society of Chemical Industry. Royal Technical College. 7 p.m. Annual Business Meeting. 7.45 p.m. Chairman's Address by Dr. I. Vance Hopper.

Leeds

February 28.—Chemical Society, Society of Chemical Industry, Institute of Chemistry and Leeds University Chemical Society. K. McLennan, "The Production and Utilisation of Cod Liver Oil," and I. Anderson, "The Manufacture of Fine Chemicals."

March 6.—Institute of Chemistry. Professor F. M. Rowe, "Advances in the Chemistry of Dyestuffs."

Manchester

March 2.—The Chemical Society. College of Technology. 7 p.m. Meeting for the reading of original papers.

March 3.—Institution of Chemical Engineers, Chemical Engineering Group, Institute of Fuel and other Societies. 2 p.m. College of Technology. Symposium on Coal Gas Purification. 7 p.m. Constitutional Club, St. Ann Street.

Newcastle

March 8.—Society of Chemical Industry. Professor H. L. Riley, "Chemistry of Solid Carbon."

Company News

Benzol and By-Products, Ltd., report a rise in gross profits from £55,302 to £83,743 in the year ended September 30. Net profits are almost doubled at £47,144, compared with £24,614.

Henry Bath and Son, Ltd., merchants in metals, minerals, nitrate of soda, chemical products and fertilisers, etc., have increased their nominal capital by the addition of £10,000 in £1 ordinary shares beyond the registered capital of £50,000.

Alpha Cement, Ltd., which is controlled by Associated Portland Cement Manufacturers, report profits for 1938 of £157,515, a decrease of £10,897. A final dividend of 5 per cent. has been recommended, following the declaration of a 5 per cent. interim dividend in August last.

